

**AN OVERVIEW OF MUNICIPAL INFORMATION SYSTEMS OF
DRAKENSTEIN MUNICIPALITY WITH REFERENCE TO THE
ACTIONIT OPEN DECISION SUPPORT FRAMEWORK**

By

Jacobus M. de Kock

Thesis submitted in partial fulfilment of the requirements for the degree of



MASTER OF SCIENCE *in* ENGINEERING (Civil)

at the

UNIVERSITY OF STELLENBOSCH

Supervisor: Mr. JAvB Strasheim

DECEMBER 2002

Declaration

I, the undersigned, hereby declare that the work contained in this dissertation is my own original work and that I have not previously in its entirety or part submitted it at any university for a degree.

Synopsis

ActionIT is a project undertaken by a consortium consisting of CSIR, Simeka Management Consulting, University of Pretoria and the University of Stellenbosch for the Innovation Fund of the Department of Arts, Culture, Science and Technology in South Africa. Their objective is to create a basic specification for selected information exchange that is compatible with all levels of government.

The comparison between existing information systems at municipal level and ActionIT specifications will be investigated for the purpose of exposing shortcomings on both sides. Appropriate features of existing information systems will be identified for the purpose of enhancing the ActionIT specifications.

The ActionIT project is presently in its user requirement and conceptual model definition phase, and this thesis aims to assist in providing information that may be helpful in future developments.

The study undertaken in this thesis requires the application of analytical theory and a working knowledge of information systems and databases in order to:

- 1. Research existing information systems and relevant engineering data at local municipal authorities. Also important will be the gathering of information regarding systems currently in use, and the format in which information is stored and utilised at municipalities.*
- 2. Do an adequate analysis of the contents of recorded information. This information will establish background knowledge on the operations of local authorities and a clearer understanding of information systems.*
- 3. Evaluate to what degree existing information systems comply with ActionIT specifications. This will be the main focus of this thesis.*

Thus the focus of this thesis is to record (provide an overview of) activities in a municipal environment and the interaction with the environment on information system level where standards provided by ActionIT as an Open Decision Support Framework can be of value.

Sinopsis

ActionIT is 'n projek wat deur ActionIT konsortium bestaande uit die WNNR, Simeka Management Consulting, Universiteit van Pretoria en die Universiteit van Stellenbosch, onderneem is vir die Innovasie Vonds van die departement van Kuns, Kultuur, Wetenskap en Tegnologie van Suid-Afrika. Hul mikpunt is om 'n spesifikasie vir informasie sisteme te ontwikkel, wat met alle vlakke van regering kan skakel.

Die vergelyking tussen die bestaande informasie sisteme op munisipale vlak en ActionIT spesifikasies sal ondersoek word vir die doel om tekortkominge aan beide kante uit te wys. Vir die verbetering van ActionIT spesifikasies moet aanvaarbare eienskappe van bestaande informasie sisteme geïdentifiseer word.

Die ActionIT projek is tans in die gebruikers vereiste en konseptuele model definisie fase, en die tesis is gemik daarop om 'n bydrae te lewer tot die bevordering van informasie wat mag help in toekomstige ontwikkeling.

Die werk onderneem in die tesis vereis 'n teoretiese kennis van informasie sisteme en databasise om:

- 1. 'n Ondersoek in die bestaande informasie sisteem en relefante ingenieurs data van 'n plaaslike munisipaliteit te doen. Die insameling van informasie oor die huidige sisteme in gebruik, die formaat waarin die informasie gestoor en gebruik word is ook belangrik.*
- 2. 'n Analise van die inhoud van die waargenome informasie te doen. Die informasie sal agtergrond kennis gee oor die werking van plaaslike munisipale owerheid en 'n beter insig in informasie sisteme gee.*
- 3. 'n Evaluasie van die verband tussen die bestaande informasie sisteme en ActionIT spesifikasies te doen. Dit is die hoof fokus punt van die tesis.*

Dus die doel van die tesis is om 'n oorsig te gee oor die aktiviteite in 'n munisipale omgewing en die interaksie met die omgewing op informasie sisteem vlak. Waar standaard wat deur ActionIT voorgeskryf word as 'n "Open Decision Support Framework" van belang kan wees.

Acknowledgements

I would like to thank the following people for their support and advice for the duration of this thesis.

1. Mr. JAvB Strasheim, my student leader in the Department of Civil Engineering of the University of Stellenbosch.
2. Mr. GC van Rooyen, for assistance in the technical side of the thesis. Department of Civil Engineering of Stellenbosch.
3. Mr. P de Villiers, Engineering and Parks, Drakenstein Municipality.
4. Ms. D Louw, Planning department, Drakenstein Municipality.
5. Ms. N van Rensburg, for all the administration at the end and the motivation all along.
6. Mr. M. Rogachennig, thanks for the notebook computer.
7. Hof Ena No. 8 for all the mental stimulation and just being there. And free lodging.
8. The Crazy Greek for all the surf outings.
9. Mr. P de Kock, thank you for making it all possible.

Table of contents

Declaration	i
Synopsis.....	ii
Sinopsis.....	iii
Acknowledgements	iv
Table of contents	v
List of Figures.....	viii
List of Tables	ix
1 Introduction	1
1.1 Background on the Project, Open Decision Support Framework (ODSF) and ActionIT	1
1.2 ODSF Structure	2
1.3 Focus of this Thesis	3
2 Literature and Technology Study	5
2.1 Introduction	5
2.2 Project Systems	5
2.2.1 Project and Processes.....	5
2.2.2 Project System Structure.....	6
2.2.3 Project System Function	7
2.3 Financial Systems.....	9
2.3.1 Financial System Structure	9
2.3.2 Financial System Function	10
2.4 Geographical Information Systems (GIS)	12
2.4.1 Introduction.....	12
2.4.2 GIS Structure	13
2.4.3 GIS Function.....	13
2.4.4 GIS Standards	14
2.5 Other Technical Systems.....	14

3	Analysis (Methodology and Findings)	15
3.1	Background on Government Structures	15
3.2	Drakenstein Municipality	17
3.2.1	Overview	17
3.2.2	The Drakenstein Municipal Structure.....	18
3.2.3	Town Engineer's Department.....	18
3.2.4	Role of Information Systems in the Town Engineer's Department	19
3.2.5	Centralisation for GIS at Drakenstein.....	21
3.3	Unified Modelling Language (UML) Approach	22
3.4	Analysis of Implemented Municipal Systems.....	23
3.4.1	Definitions (Design View).....	23
3.4.2	Processes and activities (Process View)	24
3.4.3	Software (Implementation View)	32
3.4.4	Hardware and its Control Systems (Deployment View)	36
3.4.5	User Requirement for Drakenstein Municipality (Use Case View)	37
3.5	ActionIT Standards and Specifications	42
3.5.1	ActionIT view on Project System.....	42
3.5.2	ActionIT view on Financial System	43
3.5.3	ActionIT view on GIS System.....	44
3.5.4	Uses Requirements from ActionIT	51
4	Discussion and Example.....	59
4.1	Discussion on User Requirements.....	59
4.1.1	Correlation and Discrepancies	60
4.1.2	Review Analysis - Shortcomings.....	63
4.2	Example: ActionIT Conceptual Model	65
4.2.1	Description of Model	65
4.2.2	Example Scenario	69
4.2.3	UML Activity Diagram	72
4.2.4	UML Class Diagram.....	72
4.2.5	Summary on Applied ActionIT Example	73

5	Conclusion.....	74
6	References	76
6.1	Interviews	76
6.2	Reference Documentation	76
6.3	Reference Software	77
	Appendix A: Projects at Drakenstein Municipality.....	A
	A.1 Table A1: Overview of Municipal Processes	A
	A.2 Processes in Engineering Department	A
	Appendix B: GIS Data Set Fields.....	B
	B.1 GIS Data Set Fields Engineering.....	B
	B.2 GIS Data Set Fields Electrical	B
	B.3 Types of Services/Infrastructure Providers and Information Requirement	B
	Appendix C: Vuna documents.....	C
	Appendix D: Extracts from Paarl Municipality IDP	D
	Appendix E: UML Activity Diagrams	E
	E.1 Example Scenario Part Two.....	E
	E.2 Example Scenario Part Three.....	E
	Appendix F: UML Class Diagrams	F
	F.1 Example Scenario Part Two	F
	F.2 Example Scenario Part Three.....	F

List of Figures

Nr.	Figure Title	Page
	Figure 1: Two-layer structure of the ODSF [ODSF ¹¹]	2
	Figure 2: Thesis Structure	4
	Figure 3: General Accounting Flows [Halpin ¹⁷]	9
	Figure 4: Spatial Representation of GIS [Parsons ⁹]	12
	Figure 5: Relationship between GIS and other systems [Zietsman ⁷]	13
	Figure 6: Governing structures in South Africa [www.gov.za ⁴]	16
	Figure 7: Organogram of Drakenstein Municipality. [Paarl Municipality]	18
	Figure 8: Town Engineer's Department Organogram [Paarl Municipality]	19
	Figure 9: Diversity of the information in flow to Town Engineer [Lochner ⁵]	20
	Figure 10: Overview of the Unified Modelling Approach [Booch ¹]	22
	Figure 11: Network diagram of the Drakenstein Municipality [Paarl Municipality]	36
	Figure 12: Graphical Representation of a Possible Hybrid System [ActionIT ¹⁴]	47
	Figure 13: GIS System Standards Solution Components [ActionIT ¹³]	50
	Figure 14: Application Process [ActionIT ¹⁹]	53
	Figure 15: Business Planning Process [ActionIT ¹⁹]	54
	Figure 16: Approval of Funding [ActionIT ¹⁹]	54
	Figure 17: Reporting Structures [ActionIT ¹⁹]	55
	Figure 18: Overview of Comparison between User Requirements	59
	Figure 19: Process Model Activity Outline	67
	Figure 20: UML Activity Diagram - Monitoring Activity [ActionIT ¹⁰]	67

List of Tables

Nr.	Table Title	Page
Table 1:	Financial Systems Structure	10
Table 2:	Personal monthly income distribution (%).....	17
Table 3:	Software in use – Treasury department.....	32
Table 4:	Software in use - Engineering department	33
Table 5:	Software in use – Building control department.....	33
Table 6:	Software in use – City planning department	34
Table 7:	Software in use – Electrical department.....	34
Table 8:	Software in use – Health department	35
Table 9:	Hardware at the Drakenstein Municipality	36
Table 10:	User Requirements - Drakenstein Municipality.....	37
Table 11:	Rank of User Requirements [ActionIT ¹³]	49
Table 12:	Typical Problems with Desirable Solutions [ActionIT ¹³]	50
Table 13:	User Requirement - ActionIT.....	51
Table 14:	Municipal Departmental Communication with Departments in other Spheres Government	60
Table 15:	Analysis of Elements of User Requirements – Drakenstein Municipality versus ActionIT documentation	61
Table 15 A:	Department of Provincial and Local Government	61
Table 15 B:	Department of Transport	61
Table 15 C:	Department of Housing	62
Table 15 D:	Department of Treasury and Finance	62
Table 15 E:	Public Works.....	62
Table 15 F:	Department of Water and Forestry Affairs	62
Table 16:	Correlation and Discrepancy between Municipality and ActionIT on Government Agencies and Parastatal Organisations.....	63
Table 17:	Correlation and Discrepancy between Municipality and ActionIT on Department of Land Affairs	64
Table A1:	Overview of Municipal Processes.....	A
Table B3:	Types of services / infrastructure providers and information requirements [ActionIT ¹⁴]	B

1 Introduction

1.1 Background on the Project, Open Decision Support Framework (ODSF) and ActionIT

Background: The Constitution of South Africa provides for three spheres of government, which are distinct, yet interdependent and interrelated. These spheres are local, provincial and national levels of government. The local government is the prime delivery agent implementing central government policy. Due to the difficulties of working across administrative boundaries, it has become more difficult than ever to co-ordinate the three spheres of government. [ODSF¹¹]

Objective: The objective of the ODSF's ActionIT is the creation of a specification for information systems used in local, provincial and national authorities. This would support informed decision-making, through improving co-ordination and information-sharing at all levels, which not only improves effectiveness, but also the efficiency of the decision-making process. [ODSF¹¹]

Establishing of the ODSF: Given the problem of information communication across administrative boundaries in government structures, the Department of Arts, Culture, Science and Technology (DACST) provided a research grant to the Council for Scientific and Industrial Research (CSIR) to establish a consortium; the Open Decision Support Consortium (ODSC). The aim of this consortium is to develop the Open Decision Support Framework (ODSF). As a first step the ActionIT workgroup was assembled. The purpose of the organisation is also to carry the ODSF standards into the future. Members of this consortium come from the CSIR, the University of Stellenbosch (Department of Civil Engineering), the University of Pretoria (Department of Computer Science), Simeka Management Consulting and private sector members. [ODSF¹¹]

1.2 ODSF Structure

Structure: ActionIT (previously known as ODSC) uses a participatory process involving government, private sector, researchers and academics. ActionIT will be based on a two layer democratic structure illustrated in Figure 1. The Domain Technology Committee ensures that the standards can accommodate the needs of government, pertaining to decision support. The output required from the Domain Technology Committee is an abstract business model, use cases for selected activities and actors identified in the business model and standardised terminology. This document aims to give some contribution into this subdivision. The Core Technology Committee is responsible for development of abstract specifications for standards in such a way that it is independent of any specific system platform. [ODSF¹¹]

Research framework of ActionIT: A research framework is developed around the identification and description of the core business of local government. This framework is required to determine the user needs for the information system. Therefore it should provide:

- A clear conceptual framework that will support the design and development process. The framework must reflect the relationships and linkages between all levels of government.
- A methodically sound approach to identifying user needs.
- A representative sample of municipalities to consult on user needs.
- A representative sample of other government stakeholders to provide additional input.
- A verification mechanism to reinforce the priorities being identified.

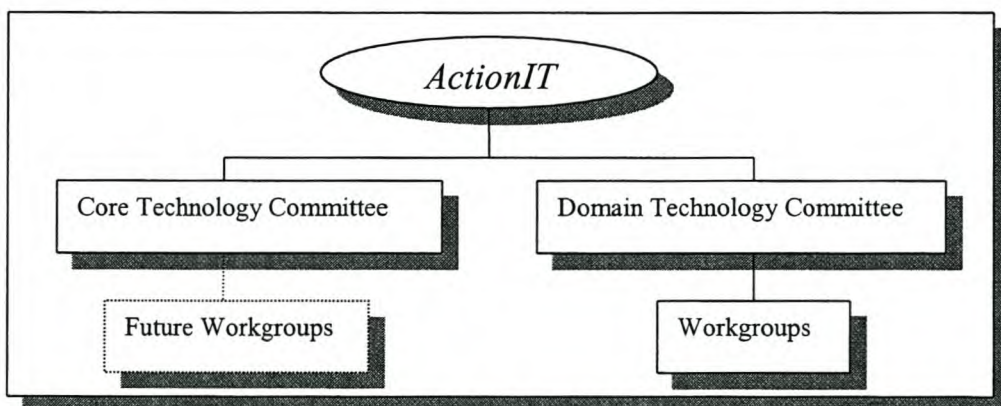


Figure 1: Two-layer structure of the ODSF [ODSF¹¹]

1.3 Focus of this Thesis

The aim of this thesis is to examine existing municipal information systems, and evaluate to what extent they conform to the ActionIT specifications available at the time of the study. The ActionIT specifications, as well as the capabilities of existing information systems at local authority level, will be analysed, compared, evaluated and documented. This document hopes to add to the representative sample of municipalities, which needs to be consulted for furthering the ActionIT needs. Therefore it could add valuable information to the process, and forms part of the ODSF's aim to create compatible specifications for information systems.

The layout of this document can be seen in Figure 2. This visual representation on the subject matter illustrates the document's format. This document is set out as follows:

Literature and Technology Review: This chapter focuses more on the technology and systems and the structure and function of these systems. It is divided into three sections dealing with the systems valuable to the local municipality. These are Project, Financial and Geographic Information Systems (GIS). Project Systems are used for project management within selected departments in the municipality. The Financial System is used in financial management functions; like general ledgers, job cost ledgers and capital planning functions. GIS Systems store and process spatially referenced data in the municipal context.

Methodology and Findings: The description of the research done for the thesis can be found in this chapter. This chapter is divided into two sections: Municipal Information Systems and ActionIT Standards and Specifications. Municipal Information Systems, the current information systems as were found on the time of the research, at the Drakenstein Municipality. ActionIT Standards and Specifications, the progress and how the standards and specifications relate to the local authority environment.

Discussion and Example: The existing Municipal Information System and the ActionIT Standards and Specifications are compared and discussed in the first part of this chapter. Secondly, for a clearer understanding of the work done, it will be explained by means of an example.

Conclusion: This is the final chapter and comes to a conclusion on the overview of the municipal information systems.

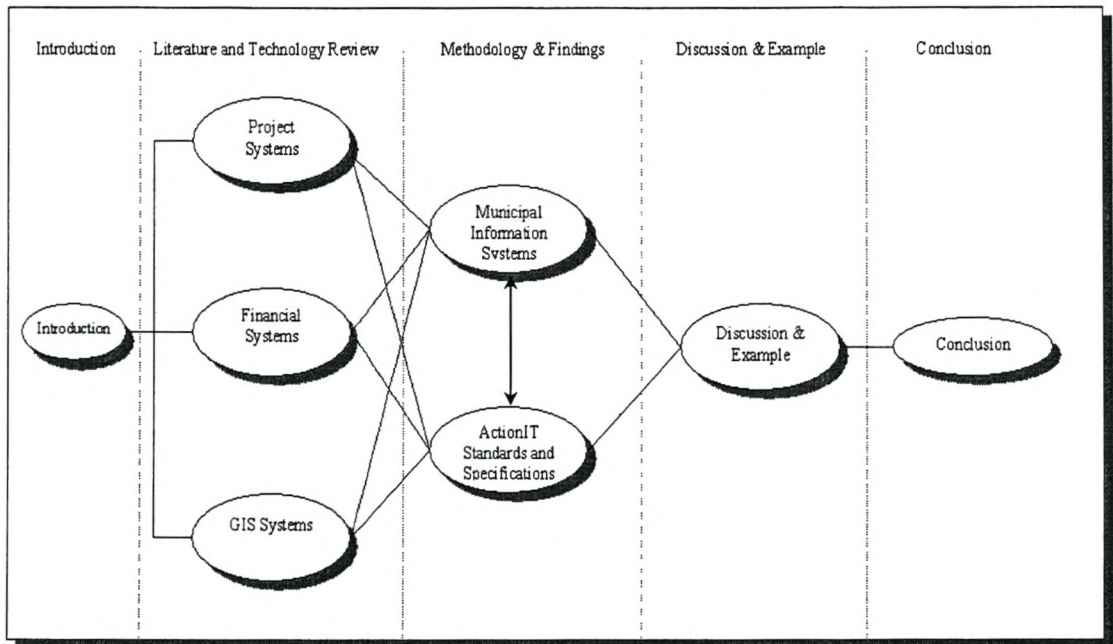


Figure 2: Thesis Structure

2 Literature and Technology Study

2.1 Introduction

The literature and technology review provides the background to the thesis; in this chapter the basic systems used in local government will be presented. The three classes of system used in local government are: Project, Financial and GIS Systems. A fourth class of system is Technical Design Systems but it is mostly for the internal use of the various departments. The systems will be discussed from a general point of view as to give the reader the opportunity to understand the theory behind the respective systems and how they fall in place within the municipal environment.

Definition of a system: A system can be defined as group of elements, either human or nonhuman, that is organised and arranged in such a way that the elements can act as a whole towards achieving some common goal, objective, or end. Kerzner¹⁵ He does state that the exact definition of a system depends on the user, environment and the ultimate goal of the system.

2.2 Project Systems

2.2.1 Project and Processes

According to Pahl¹² a system whose elements are called activities is a process. Typical processes in civil engineering are planning, design, detailing, construction, inspection and management. Main aspects of a process are:

- Specification and assignment of tasks.
- Duration and sequence of activities.

Process: A process consists of a series of activities that are ongoing and is similar to a non-terminating project. These activities need to be maintained and kept up to date throughout the lifespan of the process. The local authority business (processes) is supported by the information systems in the municipal environment. Section 3.4 deals with the processes of the different departments and the managing of the activities and processes.

Processes Hierarchy: The processes in the technical departments are logically divided into three levels. The strategic level deals with the high-level planning, budgeting and financing processes as well as high-level interaction with other departments, council committees and service providers. The functional level deals with the development project processes that have a typical engineering focus. The management level deals with the day-to-day operational, maintenance and general management processes.

External Interaction: The interaction and communication that the Drakenstein Municipality has with other government structures on the development of projects and all the processes that deal with these projects, can be seen in an overview of municipal processes in Table A1 (Appendix A).

2.2.2 Project System Structure

Activities, resources and milestones can be seen as a project's structure. Kerzner¹⁵ and Burke¹⁶ defines these as follows:

Activity: An activity may be defined as any task, job or operation, which must be performed to complete the work package or project.

Resources: A resource can be defined as a machine, or person, that will complete the scope of work within the time plan. The following resources influence the project and the structure thereof, as seen by Kerzner¹⁵ and Burke¹⁶:

- Equipment
- Facilities
- Manpower
- Material
- Money
- Information / Technology

Milestone: A milestone represents an event on a particular day, which could be when and order is placed, plans are approved, goods received or even the start and finish dates of an activity.

2.2.3 Project System Function

The function of a project system is to create easier management of a project to reach the objective, with the project system being the tool to achieve the desired result. With the help of project systems the resources of these projects and managing the projects are simplified for an easy and more comprehensive way to reach the objective of the project.

According to Kerzner¹⁵ and Burke¹⁶, project management has three main techniques, which can be seen as part of a project and its function. These are: planning, controlling and scheduling. A project system is designed to comply with the needs of the project manager, so the same three techniques apply. The definitions for them are as follows:

Planning: Burke states that planning is the process of generating a time framework for the project. Kerzner¹⁵, on the other hand, says that planning, in general, can best be described as the function of selecting enterprise objectives and establishing the policies, procedures, and programmes necessary for achieving them. Planning in a project environment may be described as establishing a predetermined course of action within the forecasted environment.

Controlling: Kerzner's definition states that controlling is a three-step process; measuring progress towards the objective, evaluating what remains to be done, and taking the necessary corrective action to achieve or exceed the objectives.

Scheduling: Burke defines a schedule as: "When documented start and finish dates are assigned to the activities of a project."

The basic functions of a project: According to Burke, is divided into seven sections. Of these sections, the system needs to be able to operate and manage each and, through this, have an influence on the project.

- Feasibility study
- Project selection
- Project Estimation
- Resource Panning
- Scheduling
- Project and Cost Control
- Quality Management

Project management software is a powerful and inexpensive tool; readily available for personal computers. Planning software's application will help with planning and control of projects; its application will only be effective if the planning and control techniques are clearly understood. [Burke¹⁶]

Planning software generally uses the following steps:

- Select where the data is located
- Order the data for the calculation
- Calculate the resource information using pre-defined algorithms.

Kerzner¹⁵ says that the systems approach may be defined as a logical and disciplined process of problem solving. The systems approach:

- forces review of the interrelationship of various subsystems
- is a dynamic process that integrates all activities into a meaningful total system
- systematically assembles and matches the parts of systems into a unified whole
- seeks an optimal solution or strategy in solving a problem

The systems approach to problem solving deals with the following aspects:

Translation: Terminology, problem objective, and criteria and constraints are defined as accepted by all participants.

Analysis: All possible approaches to or alternatives to the solution of the problem are stated.

Trade-off: Selection criteria and constraints are applied to the alternatives to meet the objective.

Synthesis: the best solution in reaching the objective of the system is the result of the combination and trade off phases.

Other terms essential to systems which apply to this study:

Objective: The function of the system or the strategy that must be achieved.

Requirement: A partial need to satisfy the objective.

Alternative: One of the selected ways to implement and satisfy a requirement.

Selection criteria: Performance factors used in evaluating the alternatives, in order to select a preferable alternative.

2.3 Financial Systems

2.3.1 Financial System Structure

The financial system supports the municipality's financial management. This system is used in the day-to-day operational management and for future capital planning. According to Halpin¹⁷, the general accounting flow of a financial system can be seen in Figure 3. The same basic structure for the financial system applies, on the financial structure, as it is seen at local authority level. The structure of such a system can be seen in Table 1. The system consists of databases that interact with the different sub-systems on different levels to create a financial system that can administrate the required financial functions. Journals are the detailed chronological log of activities, while ledgers are the summarisation of activities for reports.

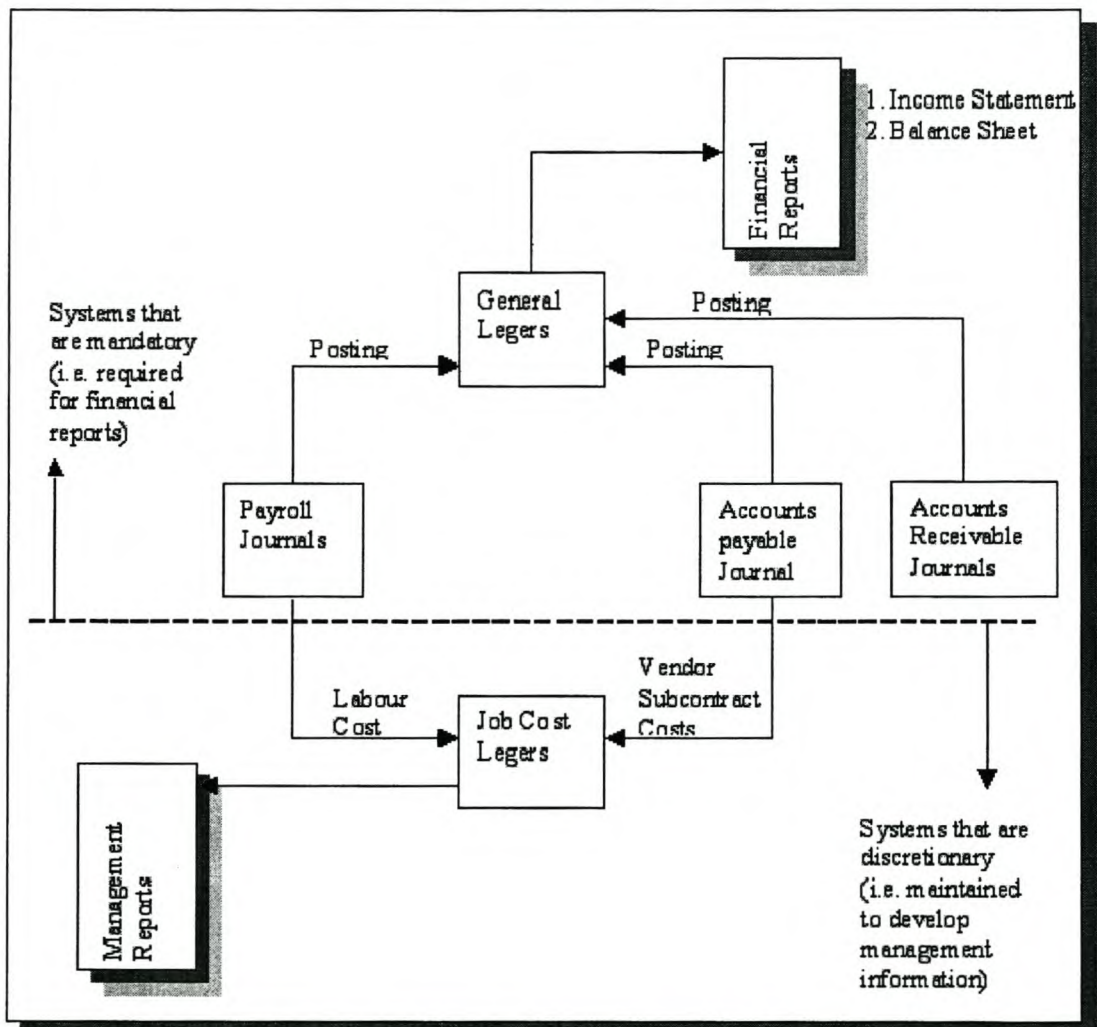


Figure 3: General Accounting Flows [Halpin¹⁷]

Table 1: Financial Systems Structure

Financial Systems Structure					
Sub-System	Transaction Journal System	Debtor System / Cashbook	Creditor System	Costing System	Budgeting System
Databases					
Ledger of Accounts	X	X	X	-	X
Debtors	X	X	-	x	X
Creditors	X	-	X	x	X
Projects	-	X	X	X	X

X – General Interaction
x – Possible Interaction

Table 1 shows a subsystem – database link logic. The different systems use data from databases and update the databases with new data, such as journal entries. Other systems, outside the financial system, also have an influence on the databases, for example, the project systems. The projects system can be linked to the financial system.

2.3.2 Financial System Function

According to Halpin¹⁷, financial data is required in order for interested parties to establish the financial status of a company or organisation. The financial system is there to run the financial aspect of the business. This is done through the interaction of the financial system with all the other systems. The functions of the financial system are numerous and other systems, like project systems can, interact with it. Key functions the financial system perform are:

Budgeting: Detailed financial planning and reporting. The system is used to develop a principal budget (capital flow budget) and the structure of the operational budget.

Billing: The system is used for billing for services and taxes.

Provisioning (Creditors): Payments to creditors are generated from the system.

Remuneration: Remunerations are done through the financial system.

Debtor management: Accounts for the debtor are created through the system.

Inventory Control: Orders, stores and supplies are managed from the financial system.

Payrolls management: Personnel remuneration planning, control and salary payments are done.

Reports: The system is able to create financial reports. Reports like balance sheets, income statements, cash-flow statements as required by the user.

Creditor management: The system can create, regulate and manipulate payments.

2.4 Geographical Information Systems (GIS)

2.4.1 Introduction

One of the most general means of storing and using co-ordinate related information through the years was by means of maps. Maps are made up of co-ordinates, of which each has an exact reference to the real point it represents on earth. Linked to these maps are data lists, which are associated to the co-ordinate points on the maps. With the arrival of computers the opportunity arose to develop a way to do information management in a more efficient and faster way. GIS was developed to create and manipulate spatial maps in a computer environment. This resulted in quicker and easier access to required information from any personal computer (with the required software) that has access to this GIS. Information such as street names, manholes, water pipe heights and diameters can be manipulated in GIS.

Principles of GIS: GIS is based on certain basic principles, one of which is its ability to save data in spatial and non-spatial format. Spatial data is the data that has a direct relation to the entity's real position. Non-spatial data is the data that doesn't have a relation to position but it is the attributes of the entity. There are three basic types of spatial entity; a point (node), a line and an area (polygon) as shown in Figure 4. The non-spatial entities are stored in data lists in the database.

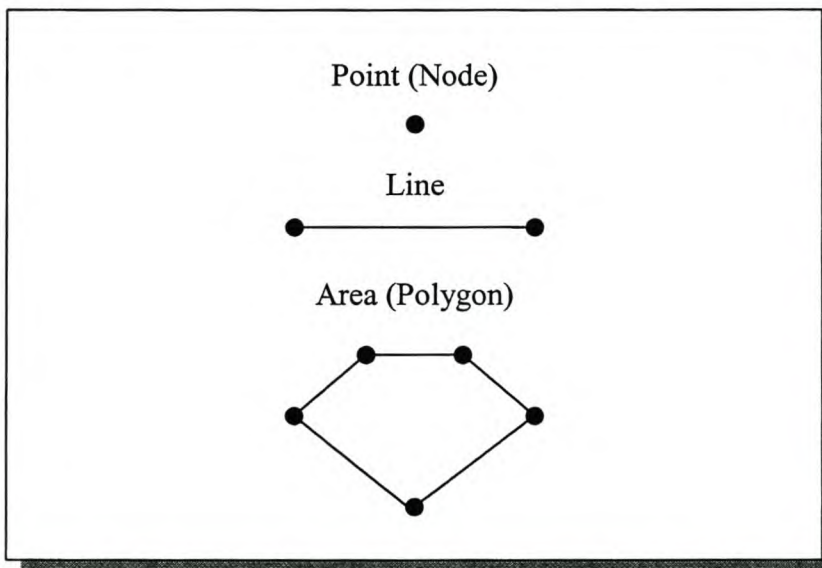


Figure 4: Spatial Representation of GIS [Parsons⁹]

2.4.2 GIS Structure

The different facets of GIS: GIS has the combined characteristics of four systems. The desired facets from the different systems are combined to make GIS the powerful tool it is. The spatial design from Computer Aided Design (CAD), non-spatial database, remote sensing, through Global Positioning System (GPS), and cartography are used as seen in Figure 5 to create GIS.

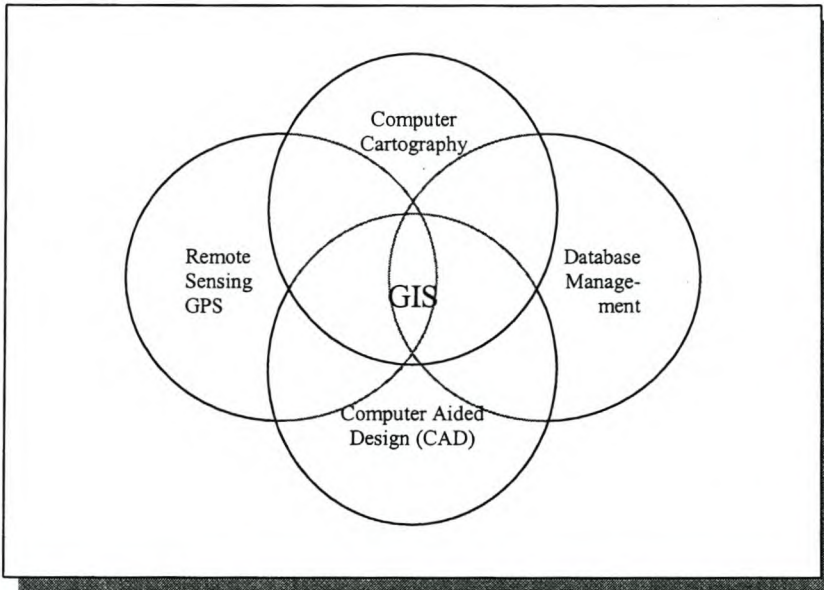


Figure 5: Relationship between GIS and other systems [Zietsman⁷]

2.4.3 GIS Function

At local municipalities, the creation and maintenance of infrastructure networks is one of the functions, especially at the engineering departments, where a range of these types of networks exists. The geographic nature of these networks creates unique problems, for example:

- The substantial amount of data generated by these networks.
- The data requires a link to the spatial maps.
- Data needs to be easily updateable, data needs to be upgraded and kept up to date.
- Complexity of queries handled.

The GIS system has the capacity to perform data and information manipulation and exchange. Therefore, the GIS system is typically at the centre of the Engineering department's information system.

GIS uses: The advantages of using GIS within the municipal environment include: multiple and integrated access to data, availability of information from a certain date, its accurate and reliable nature and the improvement of co-ordination between divisions and departments. Infrastructure services, like sewerage networks, storm water systems, street networks, water supply networks and industrial sewerage networks, can be optimised with the use of GIS for maintenance and design purposes.

2.4.4 GIS Standards

Within the GIS community, the need for information exchange between different GIS platforms has been recognised. The development of standardised information formats has been undertaken under the auspices of ActionIT. GIS software developers need to recognise and support the ActionIT initiative. Due notice has to be taken of standards developed by the ActionIT.

2.5 Other Technical Systems

Other systems that exist are mostly reserved for the use of various internal municipal departments. An example of this is technical design systems, which is only used in the design phase of a project. These are mostly technical and have limited use in being shared with other departments or external organisations.

3 Analysis (Methodology and Findings)

3.1 Background on Government Structures

Local authorities are responsible for the planning, development and management of civil infrastructure in the urban environment. The town engineer's departments are crucial components of municipal structures and have their own information systems and databases.

Government Structure: In South Africa, governing structures exist at national, provincial and local levels. This is illustrated in Figure 6.

Government decision support: In order to improve the quality of decisions taken at higher government levels, current information regarding events, at local authority level, needs to be made available to higher government levels. It is generally agreed that such access would improve the quality of higher government decisions. In order to achieve this goal, municipal information systems must support an exchange standard. Information exchange based on this standard would facilitate budgeting, financial management, service delivery, organisational performance management and strategic and operational planning, involving all levels of government.

Municipal reorganisation: After the local elections in the year 2000, the boundaries and structures of municipalities and district councils (district municipalities) have changed. Smaller municipalities were incorporated into larger ones, which, in some cases, required the merging of different information systems. Difficulties associated with this process fall outside the focus of this thesis.

Municipal information systems: At municipal level the value of well-established, inter-departmental information systems is acknowledged. These systems are helpful in creating a greater understanding of municipal issues and enhance decision support. For example, a well-established information system which improves the flow of information, improves budgeting, financial control, performance management and the management of transportation, water supply, electricity supply and housing within the municipality. This indicates that more efficient information exchange between the different levels of government would improve decision-making across the various levels.

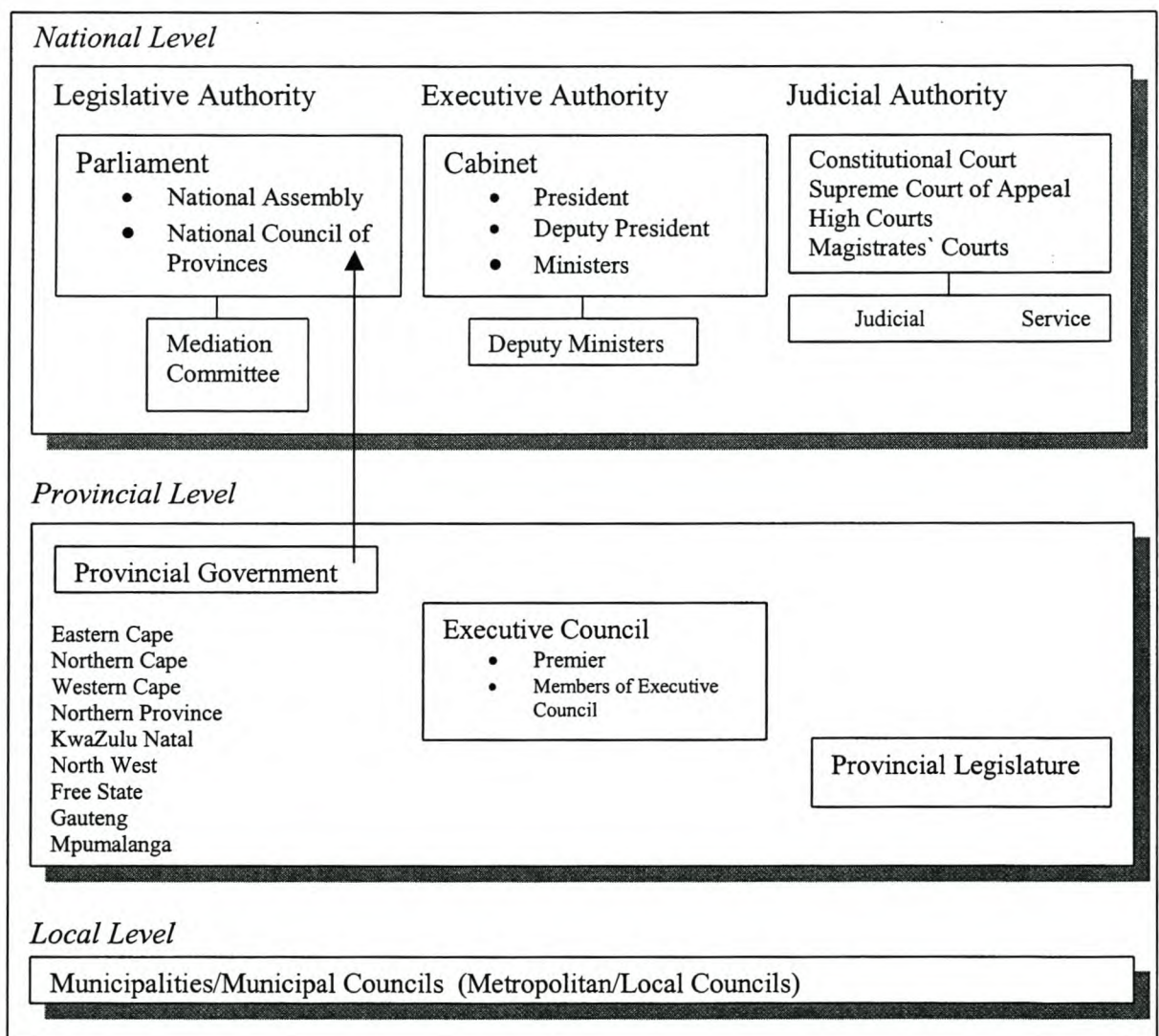


Figure 6: Governing structures in South Africa [www.gov.za⁴]

3.2 Drakenstein Municipality

The information systems (IT systems) at the Drakenstein Municipality are the subject of the research on which this thesis is based. The local government information systems in use, as well as those planned for future deployment, at the Drakenstein Municipality were studied. Information was gathered by means of interviews with the employees at the municipality, a review of the systems in place and referencing documented research (e.g. [Blignaut⁸]) on the Drakenstein Municipality.

3.2.1 Overview

The Drakenstein Municipality is situated in the Boland (Western Cape Province). It includes Paarl, Wellington, Hermon, Saron and Gouda. At the time of the investigation Drakenstein Municipality only had information on the Paarl area, resulting the use of Paarl as an example. Paarl has a population of 120 000 residents with an income group distribution as in Table 2. The amount of plots in the Paarl area are estimated at around 23 000. The annual budget for fiscal 2001 is around R 47 million for the capital budget and R 336 million for the operational budget. The nature of business in the Paarl is:

- KWV / SFW & Wine and liquor industry
- Textile industries
- Agriculture and Agriculture support (WPK) business
- Food processing (Sasco & Bokomo)
- Packaging industries (Plastic)
- Banking group (BOE) head offices
- Wellington hide tanning and processing

Table 2: Personal monthly income distribution (%)

	None	Less than R1000	R1000 to R1999	R2000 to R2999	R3000 to R4999	R5000 to R9999	R10000 to R19000	R20000 and more
Paarl	61.6	15.8	11.4	3.6	3.4	2.7	1.4	0.1
Paarl district	46	49.7	3.2	0.7	0.4	0	0	0
WDC	54.7	26.2	8.2	3.8	3.4	2.4	1.4	0.3

Paarl = Covered by the old Paarl Municipality

WDC = Winelands District Council (Now Boland District Municipality)

3.2.2 The Drakenstein Municipal Structure

The Drakenstein Municipality is divided in six departments. These six departments are: Treasury, Engineering and Parks, Building control, City planning, Electrical and Health. The organisational structure for Drakenstein Municipality is set out in Figure 7.

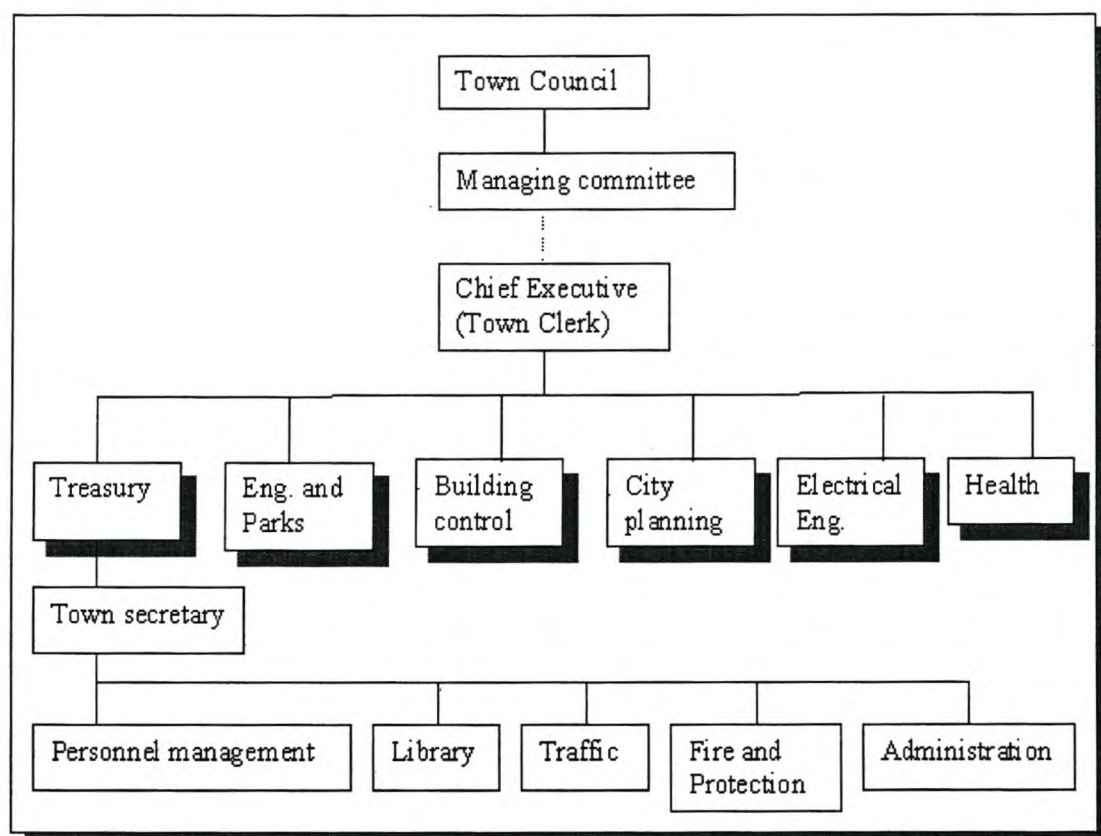


Figure 7: Organogram of Drakenstein Municipality. [Paarl Municipality]

3.2.3 Town Engineer's Department

The Town Engineer's department forms an integral part of the study, since this thesis focuses on the information systems in place at this department and ActionIT focuses on projects in government which relate to the engineering department. The role the department has within the municipality is that of the creation and maintenance of the civil infrastructure. For example: road networks, water supply and water treatment, storm water management, recreational services (parks and sport facilities) and refuse removal. It is one of the six departments in the municipality but it has an influence on most of the others. The planning, building control and electrical departments work in cooperation with the town engineer's department to

create a more efficient service infrastructure. There are different sections in this department, all with different functions. These can be seen in the organogram for the Town Engineer's department. (Figure 8.)

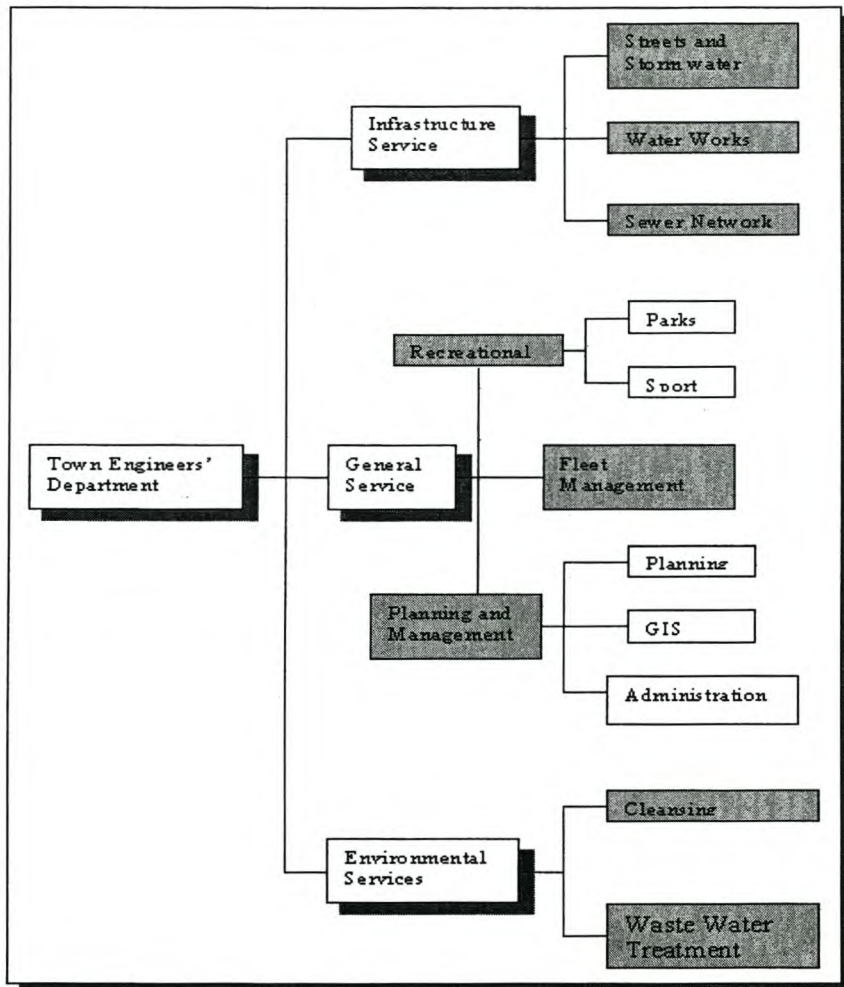


Figure 8: Town Engineer's Department Organogram [Paarl Municipality]

3.2.4 Role of Information Systems in the Town Engineer's Department

Information is one of the key aspects that ensures the operation of the Engineering department. The information exchange between departments in the municipality influences the efficiency of the planning of new projects as well as the maintenance of existing projects. An information system thus enables this department to make more informed decisions with regard to civil infrastructure development.

Figure 9 shows the different types of information needed by the Town Engineer's Department. The flow of information, from internal and organisational units, to this department, enables better decision-making and a more efficient municipality.

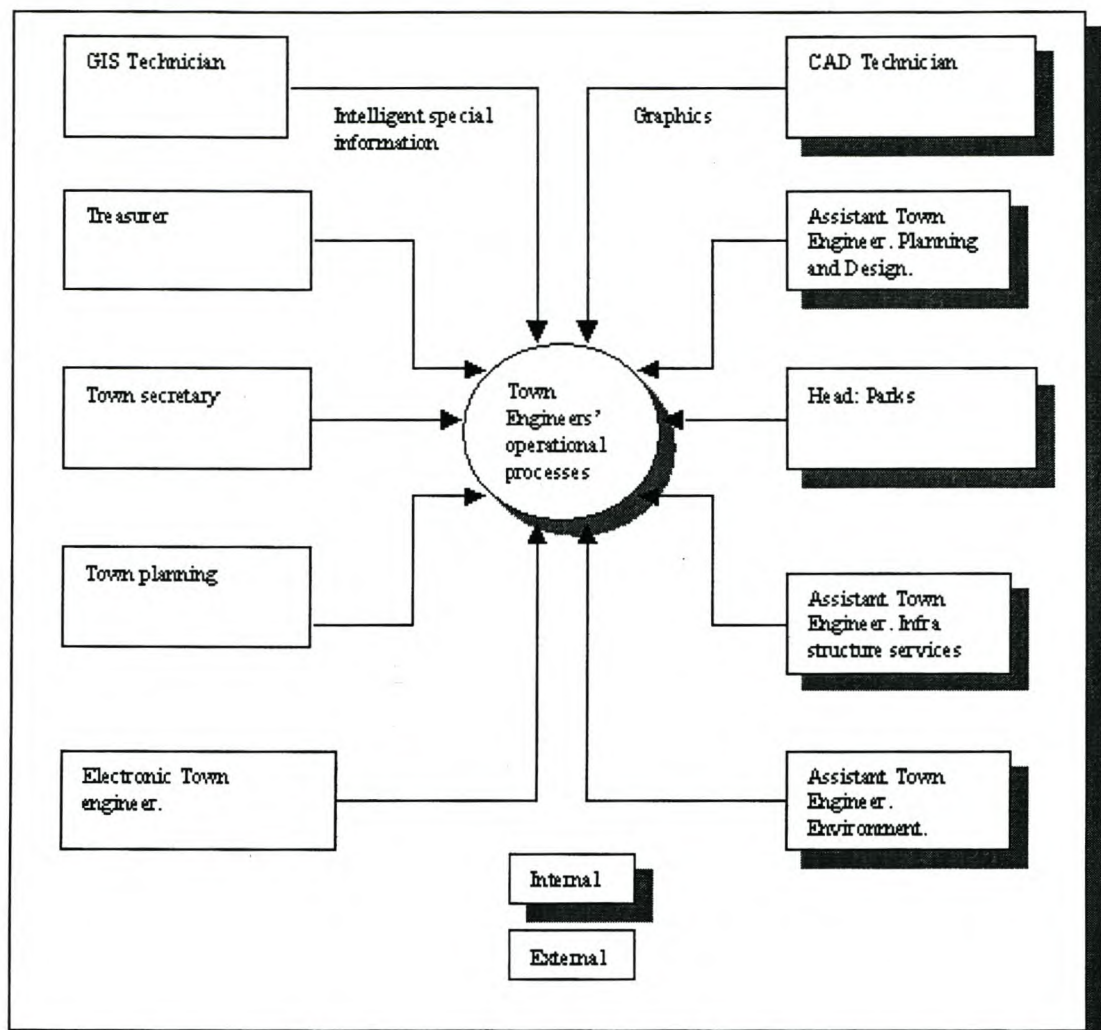


Figure 9: Diversity of the information in flow to Town Engineer [Lochner⁵]

Example: In the creation of a new urban, business or industrial development, some of the existing infrastructure that has been created over the years needs to link up to the new development. Information like property boundaries, water and sewerage network, electricity and streets can be stored in an information system, like GIS, thus increasing the efficiency of the design of new developments, zoning and property transfers. Where infrastructure maintenance is concerned, the stored information creates better history on the networks, so that maintenance, checking, upgrading and replacing can be optimised.

3.2.5 Centralisation for GIS at Drakenstein

GIS at Drakenstein Municipality: An assessment at the engineering department within the Drakenstein Municipality showed that most of their information is stored in Geographic Information System (GIS) format. In this format, maps and data are linked and can be viewed and maintained with the appropriate software tools. Since this thesis focuses on evaluation of information systems and data structures at municipal level, it will provide valuable information in the development of standards for information exchange.

GIS software: Each workstation that needs to access GIS information, on a personal computer, has GIS software tools like ArcView and MapMagic. These are completely reconcilable with the municipality's Arc/Info GIS interface.

Centralisation Effort: The Drakenstein Municipality started to centralise its GIS data, as duplicate data sets are expensive and a waste of time. The GIS data from the engineering, planning and electrical departments were being centralised at the time of the investigation. So, rather than exchanging data, a central GIS database was planned. For data fields used in the municipal GIS, see Appendix B.

The external GIS data sources come from:

- National Land Information System
 - Surveys and Mapping – Contours & DTM
 - Deeds Office – Treasury
 - Survey General – Cadastral
- Department of Water and Forestry Affairs

3.3 Unified Modelling Language (UML) Approach

The formalism used in writing section 3.3 is that of the Unified Modelling Language Approach. [Booch⁹]

When one models a system's architecture, one defines the system requirements, logical elements and its physical elements. To define a model of an information processing system using the Unified Modelling [UM] approach, one needs to:

- Identify the views used to represent the system architecture.
- Specify the context for the system.
- Dissect the system into its elementary subsystems.

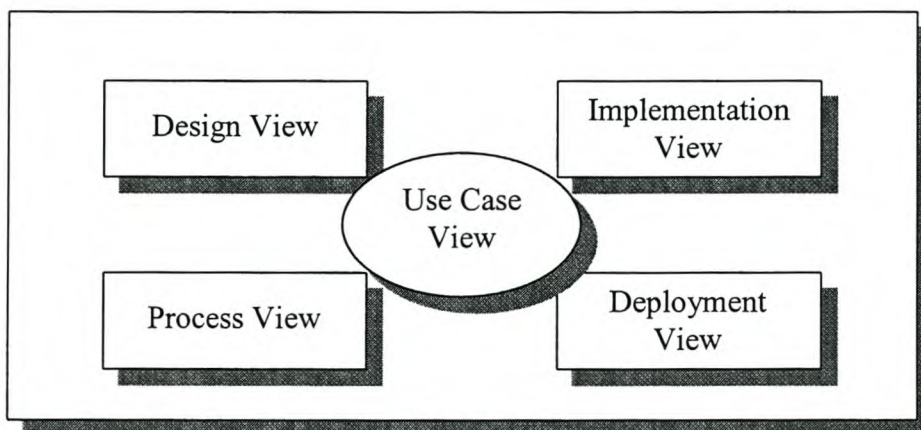


Figure 10: Overview of the Unified Modelling Approach [Booch¹]

The **Design View** deals with the mission, vision and main aim of the system. It also includes the definitions of high-level concepts, which form part of in the system.

In the **Process View** the business processes for projects with related activities and tasks are described.

The **Implementation View** can be seen as the software components of the system.

The **Deployment View** describes the development, procurement, installation, operation and maintenance of the hardware of the system.

The **Use Case View** sets out the requirements of the users of the system.

3.4 Analysis of Implemented Municipal Systems

3.4.1 Definitions (Design View)

The definitions, organisational structure, activities and main aim of the different departments in the municipality, as well as the mission, vision and the high-level strategy of each department are set out in this section.

3.4.1.1 Treasury department

The main aim of the Treasury department is to manage the finances of the municipality and to perform day-to-day administrative duties. The duty of this department is to run the municipality in such a way that it will thrive and prosper, and thus provide the best possible service to the people of Paarl.

3.4.1.2 Engineering (and Parks) department

The basic mission of the engineering department is the development and maintenance of the civil infrastructure of the city, the provision of basic services to enhance the quality of living, as well as to ensure the growth of the city by utilising its economic, natural and human resources.

3.4.1.3 Building Control department

The building control department strives to maintain building laws and is charged with the upkeep of historical buildings in the Paarl area.

3.4.1.4 City Planning department

The mission of the planning department is to support development and encourage the growth of Paarl as a town.

3.4.1.5 Electrical department

The duty of the electrical department is to strive to improve the quality of life and to make life easier for the inhabitants of Paarl, by making electricity available to all the citizens, businesses and industries in the Drakenstein municipal area.

3.4.1.6 Health department

The mission of the health department is to provide affordable health care to the needy and to help sustain an acceptable quality of life for the citizens of Paarl.

3.4.2 Processes and activities (Process View)

This section deals with the process activities of the different departments and the role that each department has within the municipal structure. The local authority business (processes) is supported by the information systems in the municipality. Therefore it is essential that the processes and activities of local authority are known, as this creates a look at what is needed from an information system point of view for further chapters.

Most of these projects and processes were investigated between December 2000 and December 2001. As a result, the information in the section is based upon the status quo as it was during that time. A fair amount of uncertainty was visible at the municipality as it was just after the municipal re-elections. This uncertainty was brought about by the changing of municipal boundaries and the confusion on where what duties will fall under the new demarcation of municipal boundaries.

3.4.2.1 Treasury department

The treasury department forms a link between the Council and the rest of the departments within the municipality. All the decisions, chosen projects and funds are channelled through the Treasury department to the rest of the municipality. The processes in this department can be seen in Table A1-1 (Appendix A).

Strategic Processes:

- Budgeting

Once a year, each department draws up a budget that is submitted to the treasury. A preliminary consolidated budget is drafted and checked by the Corporate Services Committee who, in turn, hands it to the Executive Committee. Decisions on the budget structure, which projects to fund, of the principal (capital flow budget) and operational budget, with the money available in made. The budget is finalised within this Committee before it is sent to the Council for approval.

- Financing of municipal projects and operational processes.

The Treasury department controls the financing of project financing and operational processes through the entire municipality. This creates a central governing structure for municipal financial distribution.

Functional Processes:

- Billing

The Treasury department raises some of its funds by billing for the following services and taxes:

- Water and electricity per meter reading.
- Housing.
- Taxes: Property, waste water and refuse removal taxes.
- Sundry services provided, relating to direct requests from the general public.

- Prepaid electricity system operation and management.

Electricity distribution through the pay and use system.

- Provisioning (Creditors and Inventory Management)

- Orders
- Stores
- Supplies

Management Processes:

- Remuneration

The municipality's personnel department does remunerations through the treasury department. Salaries and wages are therefore processed on an regular monthly and weekly basis.

- Debtors management

Debts are paid to the treasury department.

3.4.2.2 Engineering (and Parks) department

The processes in the engineering department are the development and maintenance of the civil infrastructure of the city. Engineering processes and activities such as the design and maintenance of roads, water supplies, municipal buildings and parks are some of the day-to-day processes and are divided into three levels; strategic, functional and management.

Strategic Processes: Processes such as infrastructure, strategic planning and developmental management are seen as the strategic processes in the Town Engineer's department, as seen in Table A1-S2 (Appendix A). Interaction with other departments, where the interchange of data is of cardinal importance, are as follows:

- The financial department, for the allocation of funds and expenses
- Electrical department, for the supply of electricity to houses
- Health department, for information on squatters, hawkers and vacant plots.
- City planning department, for the zoning of plots.
- Housing department, for ownership of plots.
- Fire department, for information on street names and fire hydrants.
- Sewage and waste disposal projects - Completion of master plan.
- Infrastructure - Storm water master plan and upgrading system.
- Services and goods suppliers (private sector)
 - Consultants
 - Software vendors
 - Contractors
 - Material suppliers

Functional Processes: Functional processes relate to engineering project development and execution of planning, design and construction of projects. These processes, such as project management, project planning and design can be seen in Table A1-F2 (Appendix A). The projects that were running, as well as those planned for the future, are:

- Parks and grounds, sports and leisure facilities projects
 - Dal Josafat Sport Stadium drainage system upgrading
 - Upgrading cricket pitches
 - Replacing filters and paving at swimming pools
 - Building Wall of Remembrance at cemetery
- Municipal and privately funded projects
 - Boschenmeer Country Estate development
 - Hugenote Mall development
 - Langeberg Mall development
 - Housing development

- Weigh bridge construction
- New 240 l steel refuse bins
- 5.5 m³ refuse containers
- Dams, water supply and reservoirs projects
 - District and zone water meters replacement
 - Feasibility study: Treatment of Paarl mountain water
 - Network expansion
- Sewage and waste disposal projects
 - Network extensions
 - Fairyland network extension
 - Extended Wellington solid waste dump site
- New water, sewer, electricity, roads and infrastructure
 - Reconstruction of Meaker street
 - Storm water upgrading projects
 - General street construction projects

Management Processes: The management and maintenance of existing facilities is an important part of the workload of the engineering department. These processes can be seen in Table A1-O2 (Appendix A).

Active processes of the engineering department include:

- Plant management
 - Waste water plant
 - Water treatment plant
 - Refuse removal
 - Storm water management
- Maintenance
 - Road maintenance
 - Park maintenance
- Bulk supply management
 - Water supply from Water board
 - Pressure control
 - Water demand management
 - Berg River supply pumping station

- Fleet control
 - The control of the municipal vehicle fleet is also an ongoing process.
- Telemetry
 - Still a manual system but a telemetry system planned to be in operation from August 2002.

3.4.2.3 Building control department

The strategic, functional and operational processes that exist in this department can be seen in Table A1-3 (Appendix A).

Strategic Processes: Building regulations are the main strategic process of this department in the municipality. The process is designed for processing and maintaining data sets on:

- Municipal buildings
- Building plans
- Inspections
- Building regulations and by-laws.

Functional Processes: Functional processes include the approval of building plans and the creation of the datasets on the buildings within the municipal boundaries.

Management Processes: The operational processes in this department are under the control of SAHRA (South African Heritage and Resource Act). SAHRA is responsible for the conservation of old and historically important buildings as well as the maintenance of municipal buildings.

3.4.2.4 City planning department

The strategic, functional and operational processes that exist in this department can be seen in Table A1-4 (Appendix A).

Strategic Processes: The processing of data for the dissemination and sharing of information on the following strategic datasets are in place:

- Management of Cadastral reference data
- Integrated Development Plan processes [Appendix D contains examples of IDP documentation produced to date]

- Creation and upkeep of topographical data and maps
- Geographical Information System (GIS) data development and maintenance (Planning drawings)

GIS reference datasets are shared with the engineering department. Each department maintains an additional set of attributes and fields for its use. [See Appendix B for details] A decision to contract out the property valuation roll database development was taken. The contractor is in the process of completing the data and implementing the system for use by the municipality.

Functional Processes: Projects currently running are:

- Study on municipal land for housing purposes and housing projects.
- Computerising all reference data.

Management Processes: Property valuation is an ongoing process that finds itself in the planning department. The Drakenstein Municipality made use of a private company to appraise the properties in the Paarl municipal area. Thereafter the values were annually adjusted by 8% or a fixed amount. By using this information, the treasurer can work out the property taxes for each year. This will be used until a new valuation is done.

3.4.2.5 Electrical department

The strategic, functional and operational processes that exist in this department can be seen in Table A1-5 (Appendix A).

Strategic Processes: One of the main processes within this department is the planning and provision of electricity to Paarl on the long run. The bulk supplier of electricity is ESKOM, but no one in this department was too sure what would happen with the merging and reorganisation of municipal departments after the elections. The electricity department will either stay with the status quo or move, as a whole, to the District Council.

Functional Processes: Examples of projects active in this department are:

- The extension of the electricity grid and provision of electricity to the whole of Paarl.
- The installation of pre-paid electricity meters has been undertaken as an ongoing process.

Management Processes: The day-to-day operation and control of electricity supply as well as the distribution network infrastructure, i.e. substations, is managed with the SCADA (Supervisory Control and Data Acquisition) system.

3.4.2.6 Health department

The strategic, functional and operational processes that exist in this department can be seen in Table A1-6 (Appendix A).

Strategic Processes: The main focus of these processes is public health care planning.

Functional Processes: There are 5 clinics and a provincial hospital in the boundaries of Drakenstein Municipality. Medical records of patients are kept, with examples of the data generated being:

- Patient number
- Patient's medical history
- Medicines provided to patient

Processes include patient care and out patient care as clinical activities.

There are other processes the health department manage. For example:

- Gathering of information (like numbers and areas occupied) on squatters. This information is then applied to improve the assistance given to the squatters in the future in order to have more control over the situation.
- Information on the number of hawkers and the areas in which they are allowed to trade is gathered. This helps with the control of informal business and creates control over certain health risks that might arise, for example from informal food vendors.
- Family planning is a process that forms an integral part of this department, as education and better planning can create better quality of life for all.
- The management of AIDS clinics and the counselling of patients are ongoing processes in South Africa. The health department has AIDS awareness clinics and it provides all AIDS related services, for example:
 - Condom distribution
 - AIDS tests
 - AIDS counselling
 - AIDS awareness

Management Processes: This can be seen as the day-to-day management of the hospital and Clinics.

3.4.2.7 Personnel department

The strategic, functional and operational processes that exist in this department can be seen in Table A1-7 (Appendix A).

Strategic Processes: Strategic processes in the personnel sector of the municipality can be seen as Labour Resource management and Labour Union Policies Development.

Functional Processes: The processes in the personnel department relate to human recourses and focus on organised labour activities:

Processes relating to human resources are:

- Hiring and selection
- Training and education

Processes relating to organised labour are the interaction with Labour Unions

- IMTU
- SAMWU

Management Processes: The management processes active in this department are:

- Remunerations
- Personnel safety and health
- Performance assessment

3.4.3 Software (Implementation View)

The implementation view, i.e. the software that is in use, as well as the software which the municipality plans on using in the future, is considered in this section. The software supports interaction between departments and even between different municipalities for the new local government dispensation. The IT system platform that is in use at the moment is *Microsoft Windows 98*² using *Novell NetWare*⁴ for networking purposes and network administration.

3.4.3.1 Treasury department

The financial software in use at the Drakenstein Municipality is the Venus¹ system. It is designed by Q-data for the municipality. This package is supposed to be incorporated into all the departments so that all the financial information of all the departments can easily be found and used.

The Venus system is designed to implement and run the IT component of the processes and activities mentioned in Section 3.3.2 and to link up and interact with the other departments.

*EasyPay*⁵ is a packaged system where the computer software regulates the weekly and monthly payrolls of the municipality. Salaries and wages are run through this system.

The table lists deployed software and applications:

Table 3: Software in use – Treasury department

Product	Function	Vendor
Venus ¹	Budget	Q-Data
Venus	Financial	Q-Data
Venus	Billing	Q-Data
Venus	Provisioning and Creditors Payments	Q-Data
Venus	Remuneration (salaries and wages)	Q-Data
Venus	Debtors	Q-Data
MS Office ³	Word processing, spreadsheets, email, internet	
EasyPay ⁵	Payrolls	Prism

3.4.3.2 Engineering (and Parks) department

Software packages in use here:

- GIS⁹ - *Arc/Info*
- *ArcView*
- *MapMagic*
- Internet (front end browser) Processing
- *Wadiso*¹⁰ – Water network design and maintenance
- *FleetFocus*¹¹ – Vehicle fleet management
- *Clarion* – development tools
- *AutoCAD*¹² – CAD drawings
- *Venus* (to be linked directly to the treasurer) – Financial system

} General spatial data

Common reference datasets for use by all GIS applications are available on the network.

Table 4: Software in use - Engineering department

Product	Function	Vendor
GIS ⁹ - <i>Arc/Info</i>	Create and manipulate GIS	SCF/GIMS
- <i>ArcView</i>	Create and manipulate GIS	SCF/GIMS
- <i>Map Magic</i>	Use and view GIS maps	SCF/GIMS
- Internet (front end)	GIS made useable	SCF/GIMS
<i>Wadiso</i> ¹⁰	Water pressure on water supply	GLS
<i>FleetFocus</i> ¹¹	Fleet maintenances	Fintech
<i>Clarion</i>	In house development programmes	
<i>MS Office</i> ³	Word processing, spreadsheets, email, internet	
<i>AutoCAD</i> ¹²	Drawings	SCF/GIMS
<i>Venus</i> ¹	Financial	Q-Data

3.4.3.3 Building control department

The software packages used here are the GIS and *Microsoft Office 98* packages.

Table 5: Software in use – Building control department

Product	Function	Vendor
GIS ⁹ – <i>Arc View</i>	Building management	SCF/GIMS
<i>MS Office</i> ³	Word processing, spreadsheets, email, internet	

3.4.3.4 City planning department

Selected software implemented in the planning department corresponds to some found in the Engineering Department.

- *Arc/Info* } GIS⁹ – General spatial data processing
- *ArcView* }
- *MapMagic* for maps and viewing of GIS
- *Venus*¹ for the financial side

Table 6: Software in use – City planning department

Product	Function	Vendor
GIS ⁹ - Arc View	Create and manipulate GIS	SCF/GIMS
- Map Magic	Use and view GIS maps	SCF/GIMS
MS Office ³	Word processing, spreadsheets, email, internet	
Venus ¹	Financial	Q-Data

3.4.3.5 Electrical department

System software in this department corresponds, in some cases, to the software found in the engineering department, although they also use some of their own design programmes.

- *Arc/Info* } GIS⁹ – General spatial data processing
- *ArcView* }
- Supervisory Control and Data Acquisition⁸ (SCADA)– Electrical network control and data logging
- Global Positioning System⁶ (GPS) information

Table 7: Software in use – Electrical department

Product	Function	Vendor
GIS ⁹ - Arc View	Create and manipulate GIS	SCF/GIMS
GPS ⁶	GPS information	
SCADA ⁸	Network control and data logging	Plessey
MS Office	Word processing, spreadsheets, email, internet	
Venus	Financial	Q-Data

3.4.3.6 Health department

The Drakenstein municipality was, at the time of investigation (June to December 2001), in consultation with Data Care and VUNA Healthcare Logistics⁷ on the implementation of computer systems for the running of the health system in the Paarl clinics and the Provincial hospital.

See Appendix C for more details of the VUNA systems and business process models for health care.

Table 8: Software in use – Health department

Product	Function	Vendor
Vuna ⁷	Health care for clinics	Data Care
MS Office ³	Word processing, spreadsheets, email, internet	

3.4.4 Hardware and Systems Software (Deployment View)

This section concerns the hardware that is available to the municipality and how and where it is used. At the moment all the workstations in all the departments have normal PC's with *Windows 98* on a *Novell Netware*⁴ system as seen in Table 9. There are about 200 Intel processor based personal computers in the municipality and more are included in the budget for the next financial year. A SQL7 (Structured Query Language) sequel server is currently being installed. Figure 11 shows the network diagram for the Drakenstein municipality. The mainframe computer has a UNISYS MCP operating system in place. The IT department was not prepared to provide any more information due to security reasons.

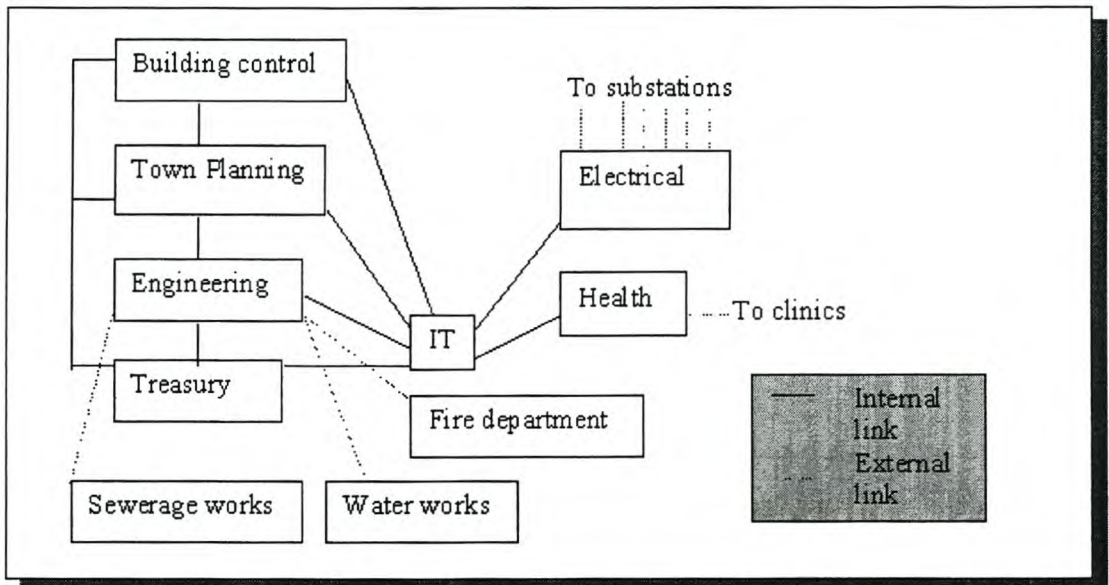


Figure 11: Network diagram of the Drakenstein Municipality [Paarl Municipality]

Table 9: Hardware at the Drakenstein Municipality

Department	System				
	PC 133	PC200	PC 500	SQL	SDE
Treasury		X			
Eng. and Parks	X	X	X		
Building control	X				
City planning	X	X			
Electrical		X	X		
Health		X			
IT			X	X	X

Product	Description
PC	Personal computer
SQL	Structured Query Language
SDE	Standard data editor

3.4.5 User Requirement for Drakenstein Municipality (Use Case View)

A use case view of a system is the view which describes the behaviour of a system as seen by the end user. This section deals with general IT system user requirements. A council employee has to use the systems and get the required results. The public and internal users in each department of the municipality must have a way of interacting with the systems. In Table 10 the user requirements, as observed at the Drakenstein Municipality, can be found. Each of the elements in the table is discussed for a clearer understanding of the user requirements.

Table 10: User Requirements - Drakenstein Municipality

	Project System	Financial System	GIS System	Other Systems
Treasury Department	Venus - Projects Cost View	Venus – Budgeting Billing Provisioning Remunerations Debtor management Payments & Payrolls Reports	Database – Information Queries	Not Applicable
Engineering and Parks Department	Project management and cost control on municipal civil infrastructure projects : - MSPProject - Spreadsheets	Venus – Project Budgeting Operational Budget	Infrastructure Development Infrastructure Planning Infrastructure Management	AutoCAD Wadiso Fleetfocus
Building Control Department	New building and approval and building Laws Project management and cost control on municipal civil infrastructure projects : - MSPProject - Spreadsheets	Venus – Project Budgeting Operational Budget	Attributes on Historical Buildings and database Enquiries	Not Applicable
Planning Department	IDP Valuation roll to the Treasury Project management and cost control on municipal civil infrastructure projects : - MSPProject - Spreadsheets	Venus – Project Budgeting Operational Budget	Land Use Planning Land Distribution Planning Database on - Property zoning - Town planning - Design record	Not Applicable
Electrical Department	Projects System – Electrical grid extensions	Venus – Project Budgeting Operational Budget	Database – Information Queries	SCADA
Health Department	VUNA – Aids Projects Family Planning	Venus – Project Budgeting Operational Budget	Database – Information Queries	VUNA – Clinic Management
Personnel Department (Part of Treasury)	Not Applicable	Venus + EasyPay for Remunerations and payrolls	Not Applicable	Not Applicable

3.4.5.1 Treasury department

Project System: As projects, in this department take the form of financial management the project system used is the cost component of the financial system. Project management reports are created by means of the job cost ledgers. The system functionality is shown in Figure 3.

Financial System: The treasury department is mainly concerned with the financial aspects of managing the municipality. Financial reports, like income statements and balance sheets, are the objective of the financial system and are created from the general ledger. They use the *Venus*¹ system to gather financial data from other departments. The following is required from the *Venus*¹ system, budgeting, billing, provisioning, remunerations, debtor management, creditor payments, pay rolls and reports.

As from December 2001 extensions to network based systems were undertaken, to facilitate on-line access to the *Venus* system from departments other than the treasury department. Interaction from outside the department with the *Venus* system, which is in off-line or paper form mode at the moment, will become on-line.

GIS System: The GIS system is used to create GIS maps of the municipal area and on which information like rates and taxes are displayed, this makes it easy to see problem areas. Further it is used to create demographic databases and use this to make queries for better and more informed decision making.

3.4.5.2 Engineering (and Parks) department

This is the department where the computer might have the biggest range of uses. The different users will have different needs.

Project System: The projects generated by this department for civil infrastructure development are mostly put out on contract. Fifty percent of the maintenance projects are contracted out to external organisations and eighty percent of new developments are also on contract to developers. Therefore, the municipality only receives progress reports on these projects. The project management and scheduling are done on MSProject while the costing is done using spreadsheets. As not too many projects are handled internally no project system package is used. The final cost figures are handled by the *Venus* system.

Financial System: Most of the financial data processing is done internally, at the Engineering department. This information is then delivered to the Treasury department through manual methods. The budget on engineering projects and the internal operational budget of the department will be linked directly to the municipality's financial system through *Venus*. At the time of the investigation, the *Venus* system was in the process of being installed.

GIS System: The end uses of the GIS in the department is infrastructure planning, development and management. In Appendix B.1 the engineering GIS data set fields can be seen. The engineers will design GIS queries and use the data for design purposes and decision-making.

Other Systems: The civil engineering design, of some of the infrastructure, is done in a different format; for example the drawings on *AutoCAD*¹² or the water network design on *Wadiso*¹⁰ or *FleetFocus*¹¹ for vehicle fleet management.

3.4.5.3 Building control department

Project System: Projects in the building control department are the approval of new buildings and building regulations in the Paarl municipal area. The project system is required to manage these. The management and costing are done using spreadsheets.

Financial System: The budget on projects and the internal operational budget of the department will be linked directly to the municipalities financial system through *Venus*.

GIS System: Creation of a database on municipal buildings in the municipal area and conducting of queries on these. Other uses of the GIS are the addition of attributes to data on historical buildings and the modification to existing buildings, to be approved by the department.

3.4.5.4 City planning department

Project System: The IDP is the main project in this department and the municipality's IDP plan is created here. The valuation roll data is forwarded to the treasurer in order for him to calculate property taxes. The management and costing are done on MSProject and spreadsheets.

Financial System: The budget on projects and the internal operational budget of the department will be linked directly to the municipality's financial system through Venus.

GIS System: GIS forms a key part of the systems deployed. This is used in land use and land distribution planning. The information is stored in a database where all the property zoning, town planning and design record work can be done on GIS. The City Planning and Engineering departments share the same data fields in some cases, as a result the GIS fields from this department can be seen as part of Appendix B.1.

3.4.5.5 Electrical department

Project System: This department does projects like electricity grid extensions and have their own project system for the project management of these projects.

Financial System: The budget on projects and the internal operational budget of the department will be linked directly to the municipality's financial system through Venus.

GIS System: In Appendix B.2 the GIS fields that are used by this department can be seen.

Other Systems: The Supervisory Control and Data Acquisition⁸ (SCADA) system is used to run the functions of the electrical grid.

3.4.5.6 Health department

Project System: Projects like AIDS Clinics and Family Planning Projects are some of this department's projects. The VUNA Healthcare Logistics⁷ system is used for this purpose. The provincial government health authorities also use the data generated in the municipal health department. An envisaged new computer system will make for better, faster and more efficient service to patients.

Financial System: The budget on projects and the internal operational budget of the department will be linked directly to the municipality's financial system through Venus.

GIS System: with the use of GIS a health distribution can be created and this will then provide the department with a means to access health data. Resulting in better information on the state of health care in the municipal area.

Other Systems: The VUNA Clinic management system is an example where another system is used. This is an external system for managing the health care services of the municipality. The detail on this can be seen in Appendix C.

3.4.5.7 Personnel department

Project System: Not Applicable.

Financial System: The budget on projects and the internal operational budget of the department will be linked directly to the municipality's financial system through Venus.

GIS System: Not Applicable.

3.5 ActionIT Standards and Specifications

3.5.1 ActionIT view on Project System

ActionIT gives very little specific information on project systems but they created a conceptual model to simulate the needs of a project system. ActionIT considers the model, A Conceptual Model of Projects in Government [ActionIT¹⁰], to be compatible with project systems that are described in government projects. The basic structure of the conceptual model is shown here, but it is described in more detail in Chapter 4.

The Conceptual Model: The unit of work is the project that has a basic or hierarchical structure. Discrete as well as continuous projects are modelled. The process model should focus on project monitoring rather than on project management. As it is assumed the government focuses on deploying the money aspect in a project. Typically, the government just monitors the deployment of the other aspects like material, men and machines. The government still needs reporting on deliverables (outcomes generated) as well as inputs (resources used) in projects. In the model the following high-level activities were identified. Each activity has a financial and a technical sub-activity. The project systems focus more on the technical side of these activities. [ActionIT¹⁰] These are:

- Formulate Project
- Register Project
- Evaluate Project
- Prioritise Project or Set of Projects
- Approve Project
- Monitor Project
- Close Project

Validation Use Cases: The robustness of a conceptual model can be validated via use cases, as stated by [ActionIT¹⁰]. The parties (Government entities) selected as candidates for use case validation are:

- Consolidated Municipal Infrastructure Programme (CMIP) Western Cape
- Department of Education
- Department of Housing
- Department of Water Affairs and Forestry
- Selected Local Government entities

The validation use cases should describe:

- Aggregation of projects from different sectors at a level of government, say local – horizontal aggregation.
- Aggregation of projects from different sectors, say housing over different levels of government – vertical aggregation.
- Different functions of a level of government operating on the same project simultaneously.
- The requirements of a project custodian invoking project services to advance a project in its life cycle.

3.5.2 ActionIT view on Financial System

The financial system from an ActionIT point of view is integrated in the same models as the project system is. For example, the process model has a financial and a technical custodian. The financial system, as seen by ActionIT, forms part of projects in government. The activities in this case are identical to those in the project systems, but the focus falls more on the financial side of the model.

3.5.3 ActionIT view on GIS System

3.5.3.1 GIS and Upper Tiers of Government

Most South African municipalities already have GIS system in place. Smaller municipalities that didn't have the funds to install such a system have been incorporated into the bigger municipalities after the reorganisation of municipal boundaries. A common denominator to link municipalities to each other and all other governing structures for information exchange can be GIS based.

3.5.3.2 GIS Standardisation Issues

GIS remains the most logical way to standardise the municipal information system, but standardising GIS has its complications. A few problem areas in the standardisation of GIS as specified in [ActionIT¹⁸] are:

a) Spatial Reference

There are two ways to refer to spatial data elements. By value, the data element is referred to by specifying its feature data, like co-ordinates at a minimum, in a valid projection system. By pointer, the data element is referred to by specifying a commonly accepted, unique identifier for the feature data that is obtainable from a different source. The decision on which system to use must be made. The problem of changing all the other references to the chosen reference system then arises.

b) Attribute Data

Non-spatial datasets form attribute datasets; these have been designed according to normalised rules. Non-spatial data systems are data-intensive systems resulting in maintainability, data integration and minimisation of storage space being the target objectives for optimisation. In database technology terms, most special data sets are resolved, which has the following implications within the GIS system; the attribute data is not the real data but a view based on related tables. This view is not the primary source of the data and cannot be the primary target for upgrading and data maintenance.

c) Accuracy

Spatial references refer to points on the surface of the earth, of which an infinite collection exists. The lack of accuracy has an effect of two layers of spatial data occurring with different levels of accuracy. That leads to problems with edge matching, overlapping, cross-sector incompatibility to name a few. Single spatial data layer problems do exist as well, for example, the spatial references might violate the topological relationships, resulting in roads being shown under the earth's surface.

d) Projection

The projection system of the spatial data was not always stored with the data; this might cause problems, as two different projections would cause erroneous values to be portrayed by the data. Under-educated end users might not be capable of transforming data from one projection to another, thus not being able to use the spatial data.

3.5.3.3 A Common Spatial and Temporal Referencing System

ActionIT aims to achieve a common and temporal referencing system for the development of the interoperable standards for Decision Support Systems, to be used across all the spheres of government. This section takes a closer look at both the ActionIT and the Drakenstein Municipality's state of spatial referencing data systems.

The aim of the ActionIT through the "Straw Dog"(preliminary solutions concept)[ActionIT¹⁴] report is to investigate and develop User Requirement Specifications, a framework for the spatial and temporal reference of infrastructure and service planning information. This report also focuses on the local government in particular.

a) Problem Statement According to ActionIT

Whilst there is increased emphasis on greater strategic co-ordination, efficiency and developmental effectiveness of service and infrastructure delivery – not only in local government, but also in other spheres of government and private sector – the existing models, management information system, basic spatial datasets and data

management systems do not always support the achievement of these aims. The inadequate interoperability of the system is an obvious major impediment; caused by limitations of the existing system, according to ActionIT, in that they do not:

- Provide a sufficiently comprehensive set of basic spatial data building blocks to quantify and map all the significant service-demanding human activities.
- Provide a standard, sufficiently fine-grained, yet computationally manageable set of basic address referencing and catchment area analysis zones.
- Provide a common, sufficiently detailed basis for exploring the future service and infrastructure demand that could be generated by likely new growth areas.
- Allow for the effective tracing and prediction of changes over time.
- Allow for consistent and statistical defensible aggregation and disaggregation of information between different spatial scales.
- Effectively harness the “higher-end” capabilities of GIS and related special analysis tools.

b) Possible Hybrid System

Hybrid: A system based on an eclectic, open-ended approach. A system which can support both local authorities as well as other service providers with the development of common area units protocol and instruments for the exchange of special data. [ActionIT¹⁴]

A possible hybrid system was seen to be the solution to the interoperability of the systems to communicate. This system would include:

- Specifications for a standard nested framework of unit areas and other common objects for interoperable data collection, planning and assessment in the service and infrastructure delivery systems.
- A zoning support system.
- Guidelines on XML-based data exchange formats.
- Guidelines on data aggregation and disaggregation.

Together this can be seen as a hybrid zoning, special referencing and translation support system. A graphical representation of this hybrid system can be seen in Figure 12.

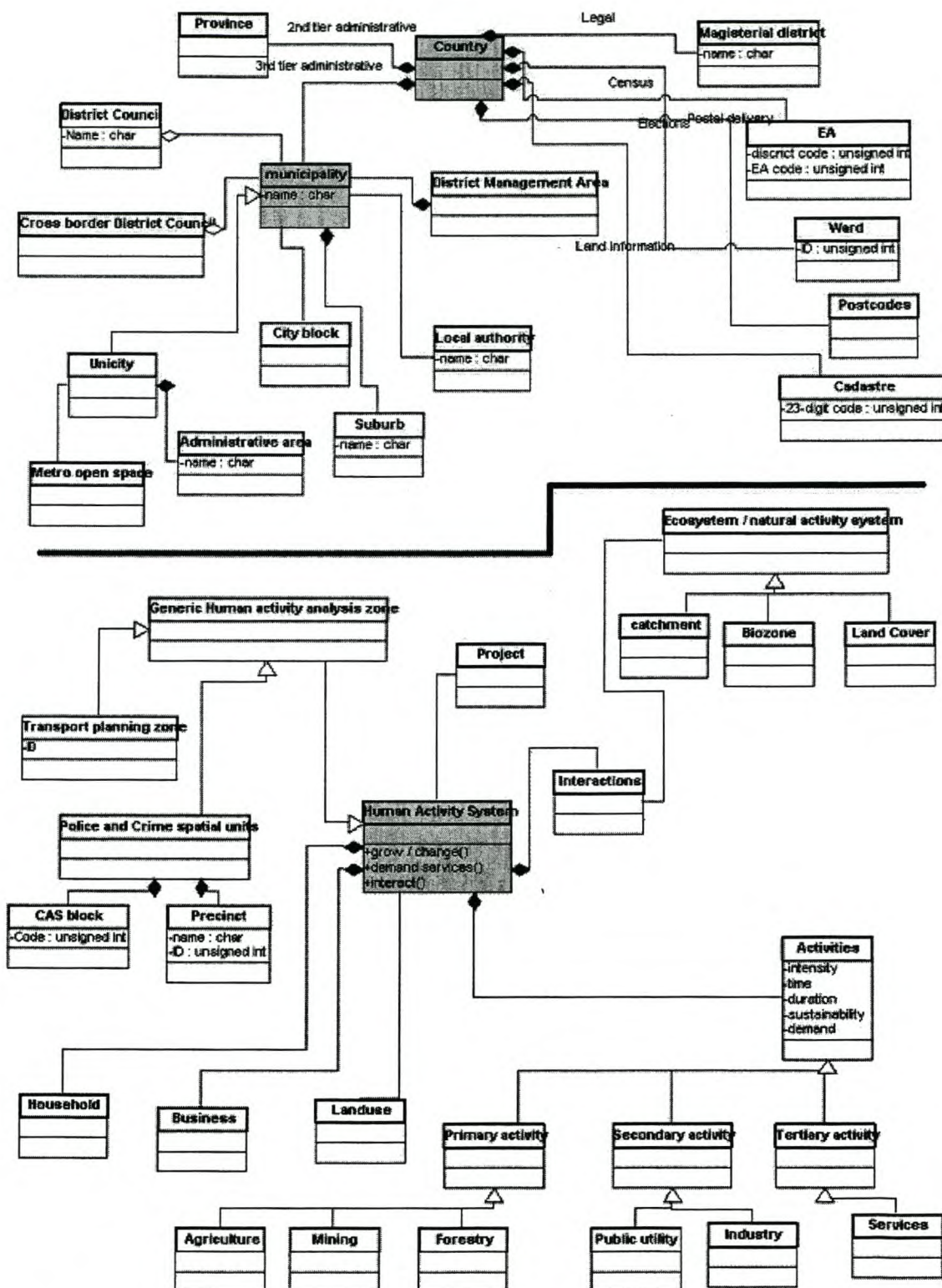


Figure 12: Graphical Representation of a Possible Hybrid System [ActionIT¹⁴]

Note: Draft UML model of systems, processes and spatial units for ActionIT.

c) Relation to Drakenstein Municipality

The Drakenstein municipality has generated their own GIS data set fields, as seen in [Appendix B]. These existing data sets correlate to those recognised by the ActionIT in Table B3 and fall into the categorised groups created by the ActionIT workgroup.

ActionIT deals with attribute data gathered for area features and not by line or point. There are many different types of areas (polygons) of varying sizes and shapes, defined for different purposes. Examples of these mapable area units are:

- Enumeration / Census
- Voting / Ward
- Municipal Boundaries
- District Boundaries
- Provincial Boundaries
- Catchment Areas
- Postal Codes Areas
- Magistrate Districts

This problem developed with the mapable area unit problem, as GIS then needs to try to analyse data recorded for different areas together. The Drakenstein municipality had, during the time of the investigation (June 2001), not yet reached the point of specifying a set base area and uses different areas for different problems. The Drakenstein municipality's GIS spatial representation was still in different forms according to the type of data and how the information was gathered and generated.

3.5.3.4 Strategies

As a problem exists with spatial referencing, this would be one of the areas to address in order to find a solution for the information exchange problem. The ideal would be to find a perfect solution but that, more often than not, exceeds possibility. So a desirable solution, driven by existing systems or solutions and goals of the organisation, needs to be found. Somewhere between the ideal and the desirable solution, as a result of cost and time constraints, an achievable solution is to be found, namely the possible solution. [ActionIT¹³]

a) Desirable Solution

The desirable solution is the solution that the organisation aims for. In Table 11, the grouping and prioritisation of user requirements, at municipal level, suggests a set of desirable solutions. By doing this, points of importance can be identified and solutions created in order of rank. Typical problems with finding a solution can be seen in Table 12. The generic solutions for these problems seem to be Meta-Data specification and Spatial referencing specification

b) Possible Solution

The possible solution is the answer to what could be the most effective possible outcome to solve the user requirements. The solution could be found in one or more of the following combinations:

- Meta-Data Specification.
- Spatial Reference Specification.
- One or more relevant attribute schema specification.

Thus the way to solve the problems is standardised specifications and standards as well as implementation guidelines. This can be seen in Figure 13.

Table 11: Rank of User Requirements [ActionIT¹³]

Requirement	Rank
Point References	3
Address/Street Location Data/Dictionary/Point Data	9
Projects (Housing and Others)	1
Facilities (Services, Health, Education)	8
Distribution (Epidiomology)	4
Networks	7
Transport Networks	2
Reticulation Networks	16
Routes and Flows	18
Transport Routes	20
Service Routes (Waste Collection, Pensions, Clinics, Libraries)	19
Demarcated Polygons	5
Cadastral Data (Property Industry, Service Supply/Demand)	6
Isometric Polygons/Surfaces	17
Catchments and Catchments Derivations for Services	13
Regularised or Computed Polygons	11
Polyhedral Coverages (Service Demand and Supply)	14
Universal Polygon Hierarchy (Postal Code Extensions)	15
Administrative and Legal Hierarchy	21
Unimap Planning Referencing System	10
Composite Hierarchies	12

Table 12: Typical Problems with Desirable Solutions [ActionIT¹³]

Remedy	Generic Solution
Enable standardised reporting of projections	Meta-Data Specification
Insist on unique identifiers being employed, enable the development of formal gazetteers.	Feature Catalogues, Typologies, Standards
Limit pointer use to discoverable, published spatial reference data sets; typically found in GSDI initiative.	Meta-Data Specification linked to Catalogue
Enforced topological relationships. Establish data quality standards or quality published data.	Meta-Data specifications
Specify rules for precision for elected application domains	Meta-Data specifications
Limit selected core datasets to a single source. Limit spatial references to accredited (qualified) data sources. Specify accuracy for selected application domains.	Spatial Referencing Specifications Meta-Data Standards

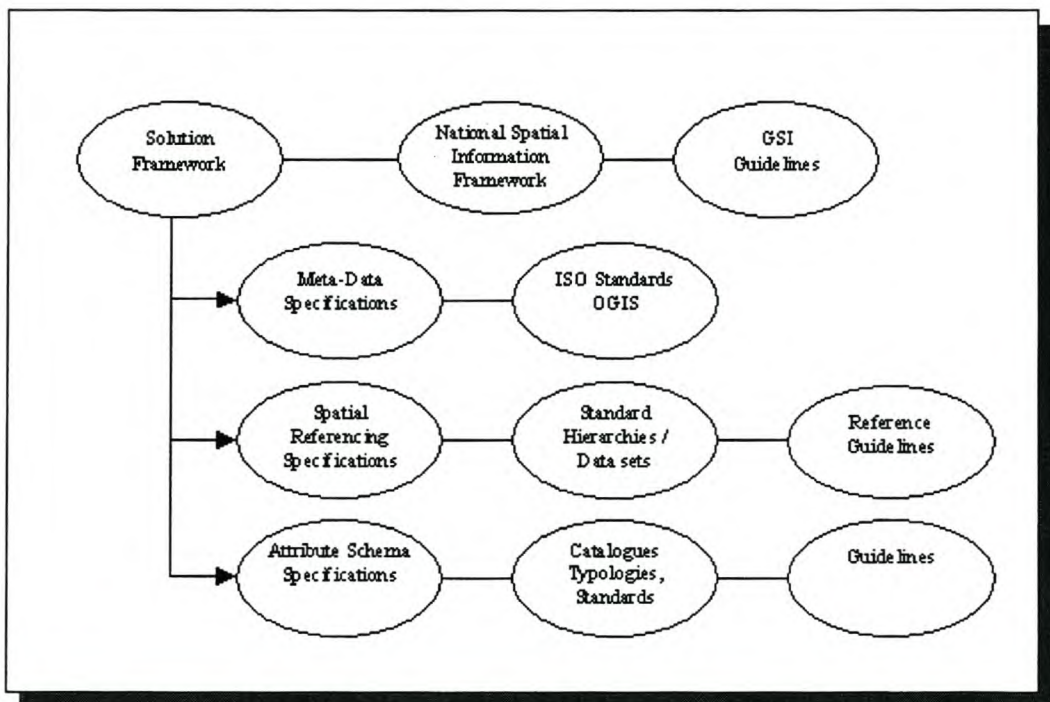


Figure 13: GIS System Standards Solution Components [ActionIT¹³]

3.5.4 Uses Requirements from ActionIT

ActionIT investigated the governmental user requirements and information systems, in order to develop specifications for the creation of a global information system. This was done across the different levels of the South African government. As this thesis focuses on the engineering side and, in particular, the engineering departments at municipal level, most of the information systems have functionality within the various project related operations.

Table 13: User Requirement - ActionIT

	Project System	Financial System	GIS System	Other Systems
Treasury Department	Venus - Projects Cost View	Venus – Budgeting Billing Provisioning Remunerations Debtor management Payments & Payrolls Reports	Database – Information Queries	Not Applicable
Engineering and Parks Department	Project management and cost control on municipal civil infrastructure projects: - MSPProject - Spreadsheets	Venus – Project Budgeting Operational Budget	Infrastructure Development Infrastructure Planning Infrastructure Management	AutoCAD MAdiso Fleetfocus
Building Control Department	New building and approval and building Laws Project management and cost control on municipal civil infrastructure projects: - MSPProject - Spreadsheets	Venus – Project Budgeting Operational Budget	Attributes on Historical Buildings and database Enquiries	Not Applicable
Planning Department	IDP Valuation roll to the Treasury Project management and cost control on municipal civil infrastructure projects: - MSPProject - Spreadsheets	Venus – Project Budgeting Operational Budget	Land Use Planning Land Distribution Planning Database on - Property zoning - Town planning - Design record	Not Applicable
Electrical Department	Projects System – Electrical grid extensions	Venus – Project Budgeting Operational Budget	Database – Information Queries	SCADA
Health Department	VUNA – Aids Projects Family Planning	Venus – Project Budgeting Operational Budget	Database – Information Queries	VUNA – Clinic Management
Personnel Department (Part of Treasury)	Not Applicable	Venus + EasyPay for Remunerations and payrolls	Not Applicable	Not Applicable

Note: * - GIS use and user requirements in Governmental departments and Parastatal Organisations not surveyed.

IDP - Integrated Development Plan

CIP - Capital Investment Programme

CMIP - Consolidated Municipal Infrastructure Programme

In all projects the need for information exchange is fundamental, but most of this exchange is still not linked to higher spheres of government. The information exchange that exists is still done through physical document exchange. Table 13 gives a representation of the information that is exchanged in the different government departments and the corresponding systems.

3.5.4.1 Department of Provincial and Local Government

The Department of Provincial and Local Government (DPLG) is responsible for overseeing the successful implementation of legislation. As the focus is on projects at local government, the Consolidated Municipal Infrastructure Programme (CMIP) and the role it has in allocating funding towards various capital budgets in local government, is investigated.

CMIP: The Consolidated Municipal Infrastructure Programme (CMIP) aims to further the Reconstruction and Development Programme (RDP) through the provision of bulk, connector and internal services, as well as community services and facilities to needy communities in ways that enhance the integration of areas. The capital grants made available by CMIP to municipalities, are to provide infrastructure and facilities in support of roads, water, storm water, solid waste disposal, clinics, cemeteries, community lighting and multi-purpose community and sport facilities. CMIP requires that the community and the IDP process determine the projects, so that the municipalities can apply for funding for them.

Key requirements: In order for municipalities to apply for funding for projects, there are certain key requirements with which they must comply. The information exchange is usually between the municipality and the provincial programme manager. Information exchange that takes place before applying for project funding is done via the Integrated Development Plan (IDP) and Capital Investment Programme (CIP). Both need to be up to date. With the application for funding there are certain official documents that need to be exchanged, for example: technical reports and business plans, placing of contracts and quality monitoring of the project. Reporting on progress, costs and any financial irregularities is done to the provincial programme manager. All this interaction is still with physical exchange of documents through the postal system.

Project Application Process: To apply to the provincial programme manager for CMIP funds, the municipality must deliver a prioritised list of projects along with a complete application form that shows how the projects comply with the funding criteria. The Department of Provincial and Local Government then either approves or rejects the proposal and informs the municipality that business plans and technical reports must be submitted as seen in Figure 14 & 15. The municipality then submits a detailed business plan and technical report, after which the provincial government either grants or rejects the application. For water and water-related projects, the municipality must supply the business plan and technical report to the Department of Water Affairs. The final approval is made by the DPLG. Before the project is approved, the DPLG checks to see if all the criteria are met and determines the conditions. The provincial programme manager is informed of the approval, the business plan and the conditions of the approval. The municipality is notified of the approval and the conditions required for funding. In Figure 16 the flow of information from the provincial government to local government is shown.

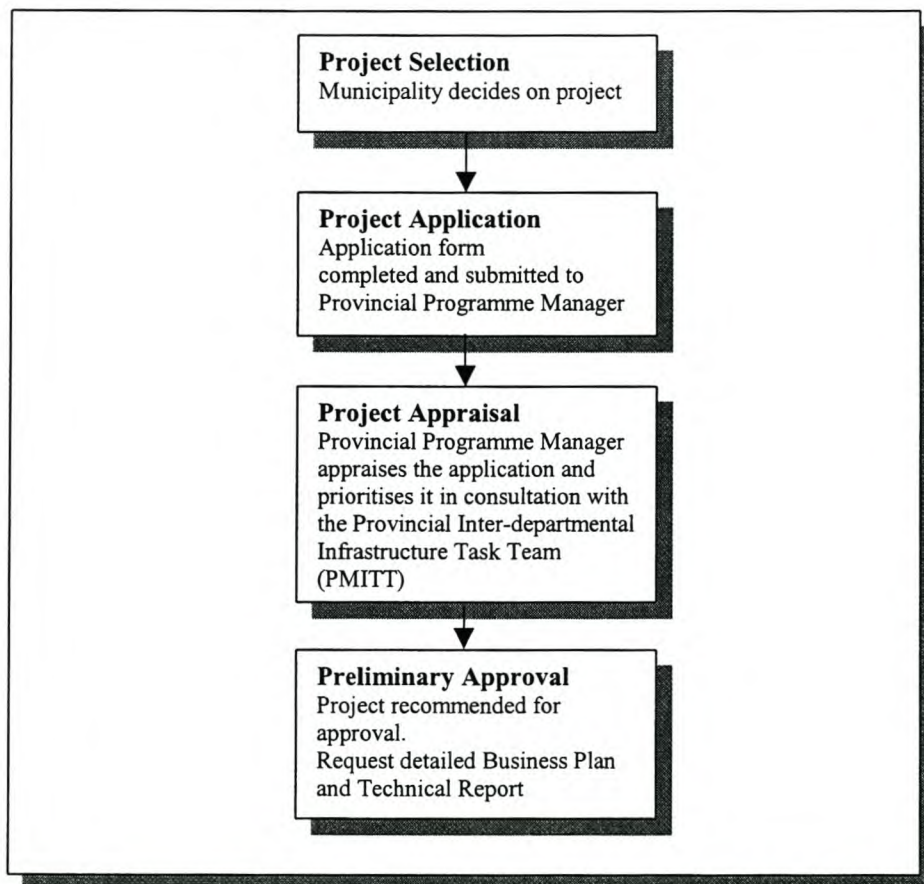


Figure 14: Application Process [ActionIT¹⁹]

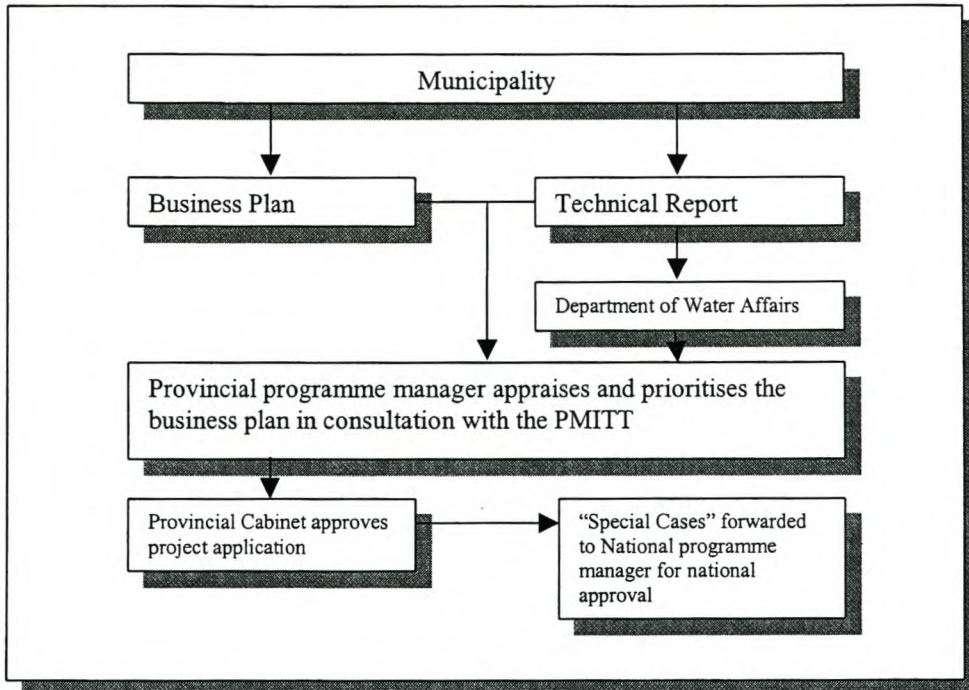


Figure 15: Business Planning Process [ActionIT¹⁹]

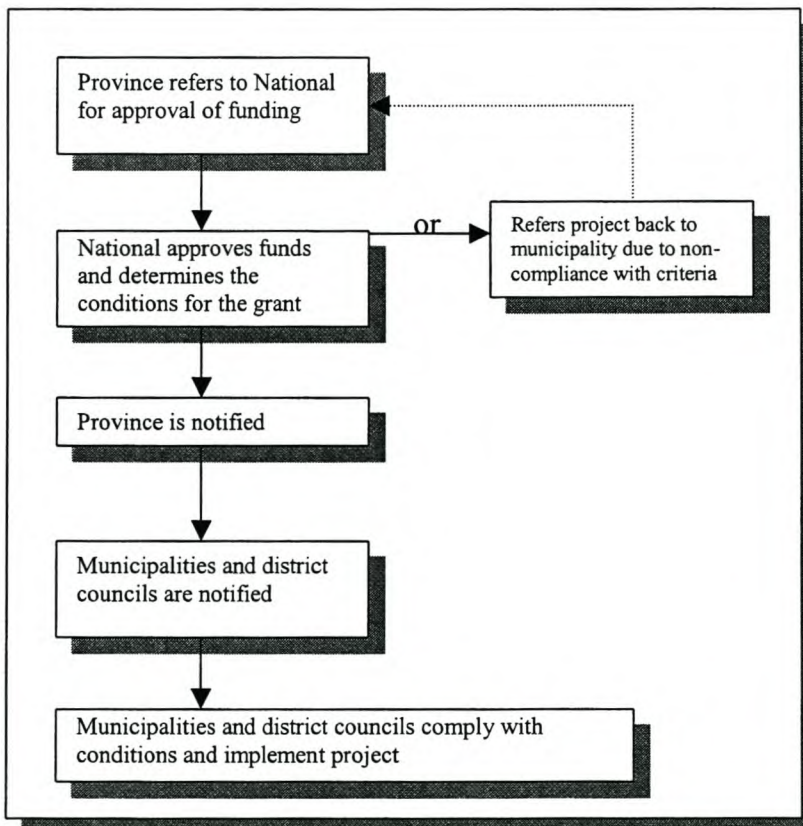


Figure 16: Approval of Funding [ActionIT¹⁹]

Key Performance Indicators: CMIP requires that municipalities must report back on the funds according to certain key indicators, such as:

- Number of jobs created
- Affirmative business enterprises used
- Training provided
- Money retained in the community
- Introduction of community based labour-based construction methods
- Using local labour, plant and materials where possible
- Municipal service partnerships formed
- Maximisation of possible opportunities of long-term job creation.
- Performance against RDP

Tender Process: Municipalities must place contracts for the construction and the supervision of projects out on tender through advertisement.

Reporting: The municipality or district council is required to submit monthly progress reports to the provincial programme manager. The report must describe the progress in terms of cost, time, quantity and the performance indicators. The DPLG requires monthly, quarterly, bi-annual and annual reports from the provincial programme manager. The reporting process is shown in Figure 17.

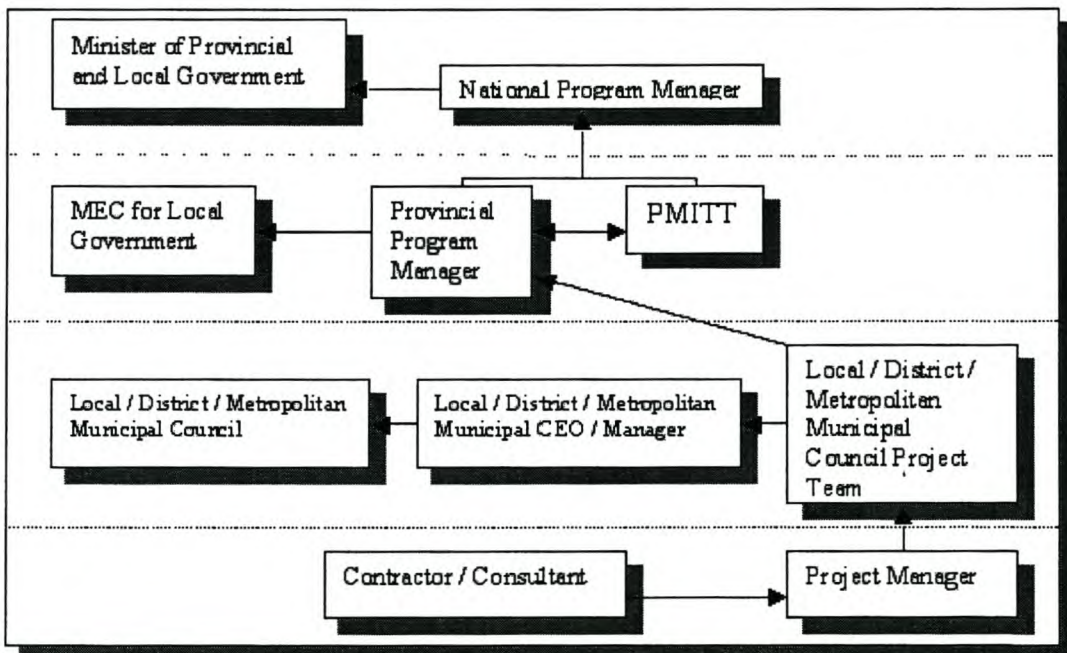


Figure 17: Reporting Structures [ActionIT¹⁹]

3.5.4.2 Department of Transport

The Department of Transport (DoT), as a whole, has a wide spread of influence. The National and Provincial departments have business processes in the following major fields:

- Freight transport
- Urban passenger transport system
- Rural and long distance passenger transport system
- Tourism passenger transport system
- Special needs passenger transport system
- Crosscutting issues affecting the long-term sustainability of the transport system as a whole in South Africa.

Secondary Roads: The building, maintenance and upgrading of secondary roads, within the district municipality boundaries, fall under the local municipality's (district municipality) control. The ActionIT report shows very little interaction and active information exchange between the Department of Transport and the district municipalities. Most of the interaction regards funding for secondary roads. The district municipality acts as an agent for Provincial and National departments for secondary roads.

Public Transport: The planning of public transport, like taxis and busses, is not bound to only one municipality; it crosses municipal boundaries. The municipal role, in this case, is restricted to work within the relevant boundaries, such as the creation of bus stops and taxi ranks.

Rail Transport: There is nothing mentioned in the ActionIT document about the information systems used to run rail transport, and how this links with the local municipalities (district municipalities).

3.5.4.3 Department of Housing

The ActionIT report doesn't mention any information exchange between the various levels of government and the municipality, but only comments on the lack of co-ordination. This lack of co-ordination between departments concerns strategic/business planning, prioritising projects, preliminary budget allocations, project planning and technical design (the submission of plans and their quality), financial management, project monitoring, and closure.

Provincial Housing Board: Is still active and is used to supply funds for housing and community development projects, but might be incorporated in CMIP.

Housing Projects: The Provincial and Local Governments control the housing projects but the National sphere supplies the funds by the use of a formula. The Local Government only forwards information concerning the number of households in need of housing subsidies. This is then used, in a formula, to calculate the amount which is to be allocated. The only feedback given to higher government structures is that of the final closure of the project.

Communication Problems: The ActionIT report states that there is a lack of co-ordination between the different departments, which then has some social effects. As no real information gets to National level, problems are created and, in effect, the effectiveness of decision-making and the success of improving living conditions that these projects could have, is hindered. There is no feedback from the Local municipalities on aspects other than the completion of new housing projects, causing an unbalanced view of the state of infrastructure (like employment, school and others) at higher government level, for example: the monitoring of such housing projects' indicators could help the National Government with planning, as they get up to date and accurate information on existing projects.

3.5.4.4 Finance and Treasury

Communication that exists between Local Government and National Government is in the form of the annual budget that is supplied to the Department of Finance and Treasury. Furthermore, the local municipalities must report back within 30 days of the end of each quarter regarding actual expenditures-to-date and any budget modifications. The Department of Finance and Treasury supplies the format that will be required for the local budget and budgetary oversight.

3.5.4.5 Public Works

Projects in this department are divided into two levels, national and provincial. National includes state owned buildings, defence force facilities, police facilities and correctional facilities. Provincial level includes provincial owned buildings, public schools, clinics and hospitals. Interaction between the Department of Public Works and district municipalities takes place on government property within district municipal boundaries. Most of the information concerning projects in the Department of Public Works is dealt with within the department itself. Little information exchange therefore exists between the local municipalities and Public Works. The information exchange that exists, is the same as with any new development within the municipal boundaries and that of water supply, electricity supply, refuse removal and road access. In some cases, interrelation on Correctional Services facilities is needed, as permission needs to be granted by the community.

3.5.4.6 Water Affairs and Forestry

ActionIT does not identify any exchange of information between the Department of Water Affairs and Forestry and local authority. However, for water related projects, the municipalities do apply for funding to the Department of Water and Forestry, or through the department to CMIP. These include projects like water distribution and collection, bulk water distribution and water supply projects.

4 Discussion and Example

4.1 Discussion on User Requirements

In this section, the standards of information exchange, as set by ActionIT's user requirements, is compared to the user requirements and information systems in place at the Drakenstein Municipality. Figure 18 gives an overview of the focus of this section. The grey area shows where the two sets of user requirements should meet. The question is: how compatible are these two sets of user requirements and can they comply to a set standard in the future. In chapter 3, we were exposed to what exists from the municipal and the ActionIT point of view. Now follows the comparison between these two sets.

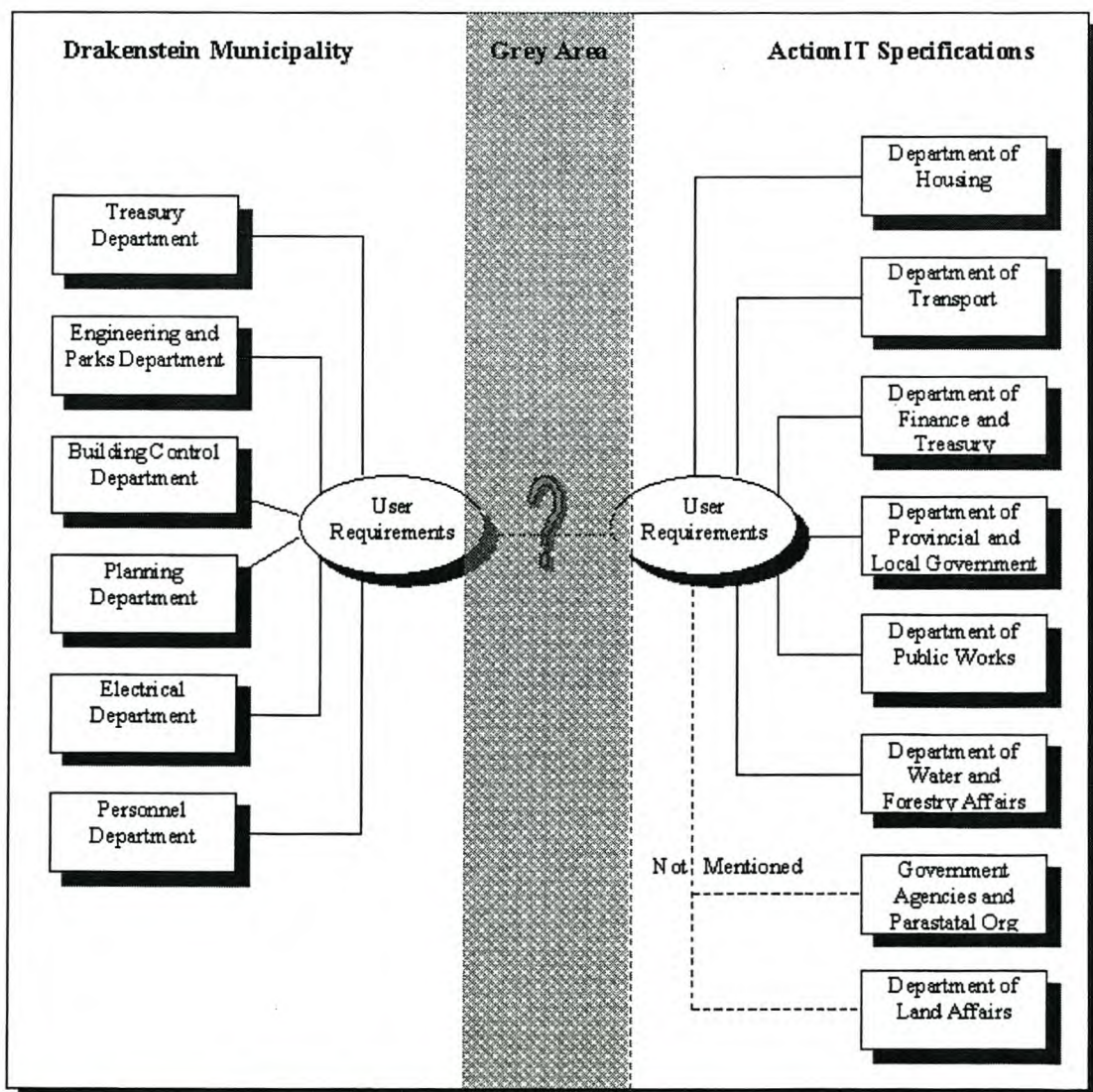


Figure 18: Overview of Comparison between User Requirements

4.1.1 Correlation and Discrepancies

As ActionIT mostly focuses on projects in government, not all the information is directly comparable to the municipal user requirements, as it was done for the whole of the Drakenstein Municipality. So, when the user requirements from Drakenstein Municipality (Table 10) are compared to the user requirements as stated by ActionIT (Table 13), it is noticeable that the main subdivisions are different. In order to bridge this, a method of cross referencing is necessary. Table 14 shows which municipal departments interact with which higher governmental organisation.

Table 14: Municipal Departmental Communication with Departments in other Spheres Government

Municipal Departments	Interaction with
Treasury Department	Department of Local and Provincial Government Department of Finance and Treasury CMIP funds Government Agencies and Parastatal Organisations
Engineering and Parks Department	Department of Local and Provincial Government CMIP funds Department of Transport Department of Housing Department of Water and Forestry Affairs Government Agencies and Parastatal Organisations
Building Control Department	Department of Housing Department of Land Affairs
Planning Department	Department of Housing Department of Land Affairs
Electrical Department	Government Agencies and Parastatal Organisations
Health Department	No interaction mentioned in ActionIT
Personnel Department	No interaction noted other than with Labour Unions, but nothing mentioned about Labour Unions in ActionIT

The information exchange between these entities is illustrated in Table 15 - from Sub Table A - F. These are the departments in which the ActionIT specifications did exchange information, or have some form of connection between the government and local authority. In some cases, ActionIT mentioned that there is interaction with local authority but showed no specific examples; only mentioning the problems that do exist. These discrepancies are visible as is noted in the tables where nothing were mentioned from the ActionIT's Projects in Government: User Requirement.

Table 15: Analysis of Elements of User Requirements – Drakenstein Municipality versus ActionIT documentation

Table 15 A: Department of Provincial and Local Government

	Drakenstein Municipality	ActionIT
1	Integrated and Development Plan and Capital Investment Programme to DPLG	It needs to be up to date
2	Funding Application	Application form for funding that shows how project comply
3	Physical Business plans	Business plans
4	Physical Technical reports	Technical reports
5	Municipality receives notice	DPLG informs the municipality of preliminary approval
6	Municipality is informed of approval	Municipality is informed of approval
7	Municipality posts project up for tender	Municipality advertises tender for project
8	None stated by municipality	DPLG requests notification of key performance indicators while project is running
9	Reporting and monitoring reports to DPLG	Reporting and monitoring reports to DPLG

Table 15 B: Department of Transport

	Drakenstein Municipality	ActionIT
1	Only exchange is on funding of development or maintenance	Little information exchange exists on road network development and maintenance
2	Land Transport Planning	Land Transport Planning
3	Taxi Registration	Taxi Registration & Administration
4	No information on exchange on Bus Contracts & Administration	Bus Contracts & Administration
5	Project Funding	Project Funding
6	No information exchange is mentioned on Rail Transport	No information exchange is mentioned on Rail Transport

Table 15 C: Department of Housing

	Drakenstein Municipality	ActionIT
1	Application for housing project funds	Nothing mentioned
2	Approval of funds	Nothing mentioned
3	No information exchange on monitoring of projects are supplied	Nothing mentioned
4	Informs DoH of completion of project	Nothing mentioned

Table 15 D: Department of Treasury and Finance

	Drakenstein Municipality	ActionIT
1	The form which the annual budget must comply to are prescribed	Finance & Treasury prescribes the form which the annual budget must comply to
2	The annual budget	The annual budget
3	End of each quarter budget report	End of each quarter budget report

Table 15 E: Public Works

	Drakenstein Municipality	ActionIT
1	Approval for special projects	Approval for special projects
2	Usual new project interaction	Nothing mentioned

Table 15 F: Department of Water and Forestry Affairs

	Drakenstein Municipality	ActionIT
1	Application for funding – water treatment plants	Nothing mentioned
2	GIS data exchange: - Water control regulations - Water rights - Dam safety grading - Area catchment data	Nothing mentioned
3	Water demand if district municipality isn't responsible for bulk water supply	Nothing mentioned

Note: Government Agencies and Parastatals Organisations like Telkom, Eskom, Transnet (i.e. Metro Rail & Spoornet), DBSA and Statistics South Africa and Department of Land Affairs interaction exists but is not dealt with by the ActionIT. See Table 16 and 17.

4.1.2 Review Analysis - Shortcomings

The following section focuses on issues untouched by ActionIT specifications. An area of concern is the lack of indication, in information exchange and user requirements, between local authority and Government Agencies, Parastatal Organisations and the Department of Land Affairs. It was noted that the ActionIT specifications doesn't cover these areas, thus it can be seen as a shortcoming.

4.1.2.1 Government Agencies and Parastatal Organisations

The interaction between these organisations and local authorities is not mentioned in the ActionIT report Projects in Government: User Requirement. Communication between local government and parastatal organisations like Eskom, Telkom, Transnet, Statistics South Africa and Development Bank of South Africa (DBSA) does exist. Statistics South Africa requires information on expenditure in local government projects on an annual basis, or as requested. Telkom requires information regarding telecommunication infrastructure that needs to take place. Some of this information includes cable ducting, manholes, junction boxes and cable network installation. Information exchange with Eskom concerns bulk electricity supply.

Table 16: Correlation and Discrepancy between Municipality and ActionIT on Government Agencies and Parastatal Organisations

	Parastatal	Communication	ActionIT
1	Eskom	Communication exists	Nothing mentioned
2	Telkom	Communication exists	Nothing mentioned
3	Transnet a) Spoornet b) Metro Rail	Communication exists	Nothing mentioned
4	DBSA	Communication exists	Nothing mentioned
5	Statistics South Africa	Communication exists	Nothing mentioned

4.1.2.2 Department of Land Affairs

No mention of the Department Land Affairs is made in the ActionIT specifications on information exchange. The municipality does exchange GIS related data and information with this government entity. This is an area where the municipality does have information exchange, thus a shortcoming on the specification side.

Table 17: Correlation and Discrepancy between Municipality and ActionIT on Department of Land Affairs

	Drakenstein Municipality	ActionIT
1	GIS information on Surveys and Mapping	Nothing mentioned
2	Information on Deeds	Nothing mentioned
3	Surveyor General – Cadastral	Nothing mentioned

4.2 Example: ActionIT Conceptual Model

4.2.1 Description of Model

System model processes: The basic unit of work in the model is the ProjectElement component. A number of terms, such as activity, work package, task, sub-project, project programme and management process, can apply here. Typical activities and events that change the state of the system are:

- Allocation of responsibility to deal with a project or a given activity to a specific person / group of persons / organisation.
- Allocation of decision-making responsibility on a set of ProjectElements.
- Changes in legislation / policy / strategy / goals / procedures which have an impact on a ProjectElement and its referred activities.
- Specifications of administrative procedures, which need to be followed in project process, related activities.
- Allocation and management of project data (object) access rights to groups performing specified project process activities.

Conceptual Model: A successful modelling exercise will yield **generic, unifying conceptual** models for both the behavioural and structural aspects of the problem domain of projects in government:

- A model will be **unifying** if it addresses the needs of projects across sectors, the needs of ongoing as well as discrete projects and the needs of sophisticated, structured projects as well as projects with a basic one-level structure.
- A model will be **conceptual** if it provides for, but defers (hides) the right detail and level of detail.
- A model will be **generic** if it avoids semantic debates such as the difference between programmes, projects, subprojects, phases, milestones and activities or the difference between objectives, outcomes, outputs and deliverables.

The conceptual model will have static (form, structure) and dynamic (functional, behavioural) aspects. The model addressing the behavioural aspects of the problem domain as a **process model**, which models the changes of the state of the system. The model that addresses the static aspects of the problem domain is named the **enterprise data model**, which will be static in nature. [ActionIT¹⁰]

4.2.1.1 Process Model

The Process Model aims to be a generic unifying conceptual model for components of behavioural aspects of the problem domain of projects in government. This model is based on project monitoring and supports metaphors such as value-added chain, control through double entry bookkeeping and risk management by reducing uncertainty. This model includes parallel sub processes of financial, technical, social, legal and environmental aspects that inform each other. [ActionIT¹⁰]

The focus of the process model: As previously stated, the unit of work is the project that has a basic or hierarchical structure. Discreet as well as continuous projects are modelled. [ActionIT¹⁰]

Three Swimlanes in UML Diagram: Swimlanes are the vertical and horizontal lanes that are included in the UML activity diagram. They represent departmental or function roles in an organisation. There are:

- Financial Custodian
- Technical Custodian
- Project Co-ordination and Control

High-level Process Activities: In the model, the following high-level activities were identified. Each activity has a financial and a technical sub-activity. The project systems focus more on the technical side of these activities. [ActionIT¹⁰]
These are:

- Formulate Project – quantifying needs and other imperatives.
- Register Project – establish a register of needs, prospective projects.
- Evaluate Project – rating prospective projects for feasibility.
- Prioritise Project or Set of Projects – ranking prospective projects.
- Approve Project – committing budget and other founding streams.
- Monitor Project – authorising expenditure.
- Closure Project – reversing unspent resources and / or unsatisfied needs.

All of these activities are set out in the UML activity diagram; the layout of which can be seen in Figure 19. The primary activity of the process model is the monitoring activity where the quantified monetary resource is offset with the progress. In Figure 20 a closer look at the monitoring activity is taken.

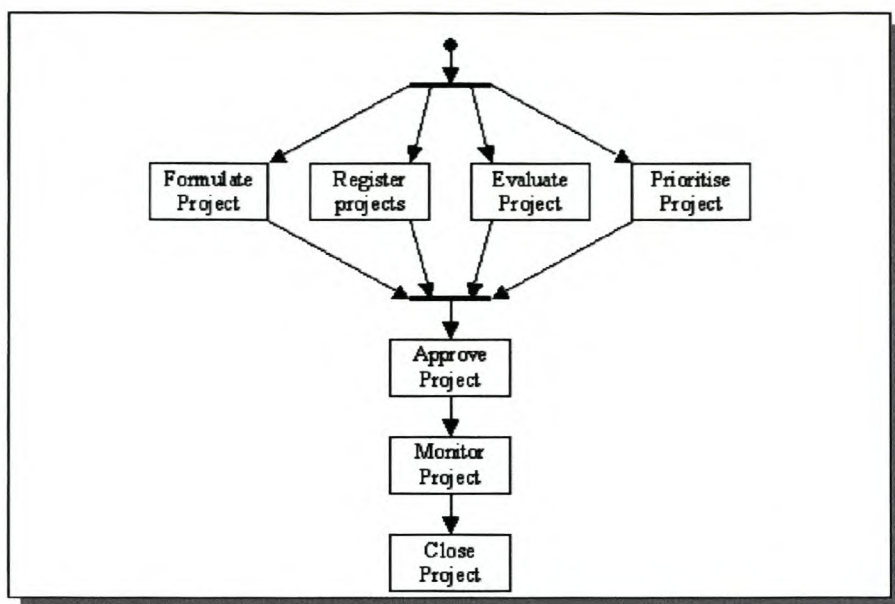


Figure 19: Process Model Activity Outline

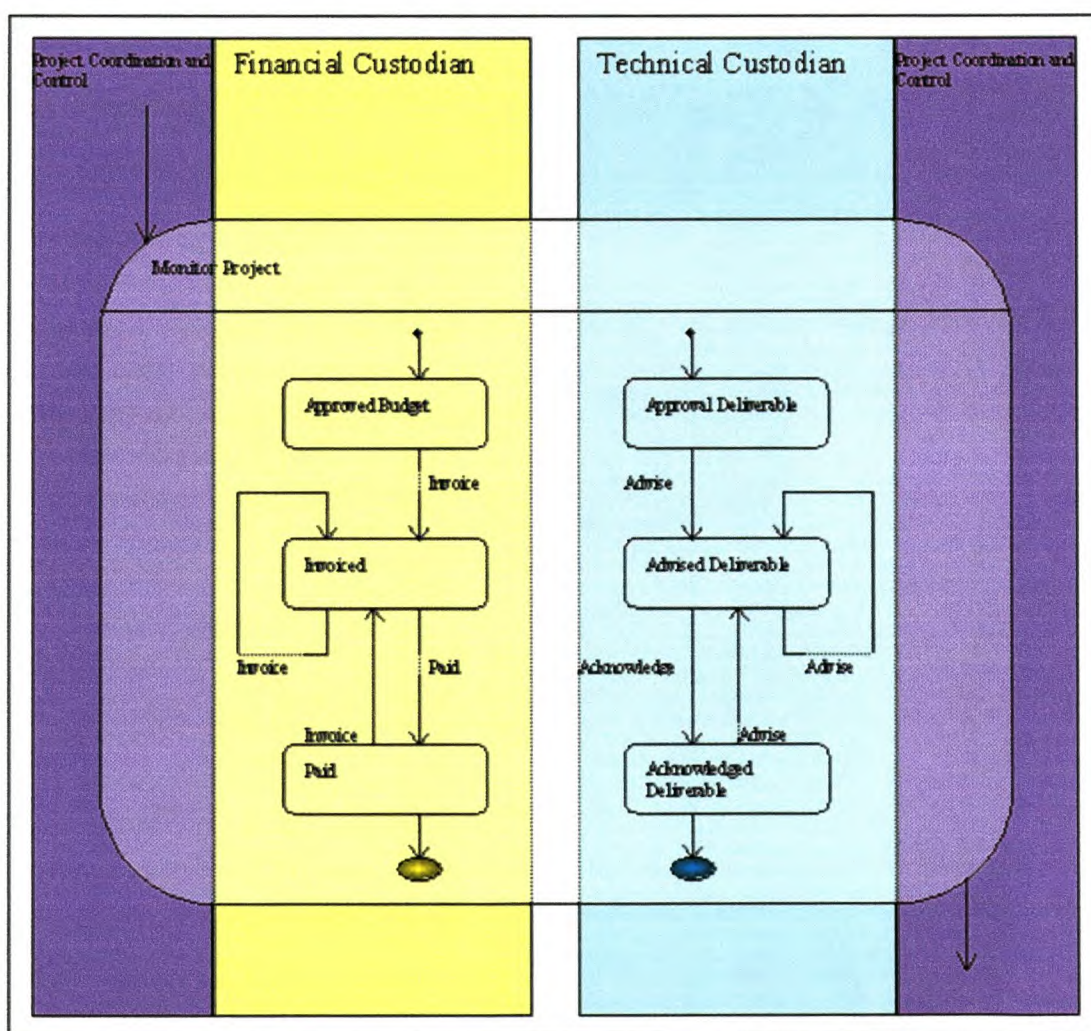


Figure 20: UML Activity Diagram - Monitoring Activity [ActionIT¹⁰]

This model's activity is one where quantified monetary resource is offset by progress such as technical, legal, social and environmental. The project reaches closure when the process has totally balanced the financial and sequential resources. In section 4.2.2 an example from the Drakenstein municipality can be seen.

4.2.1.2 Enterprise Data Model

This model aims to be a generic unifying conceptual model for the static or structural aspect of the problem area of projects in government. This model includes components, context, meta-data as well as stereotypes, stereotype mapping and aggregation.

Meta-Data: Meta-data is data that describes the variant aspect of behaviour, which can be seen as parameterised behaviour.

Stereotypes: Stereotypes stand for an entity or entities with associations or associations with established semantics. These are:

- **Composite** – a group of projects are composite if they contain one or more deliverables and zero or more projects.
- **Account** – this means that the value of the deliverables can either be increased or decreased as part of a series of entries.
- **Observation** – saying an entry is an observation means that an entry against a deliverable can be quantitative, qualitative or descriptive.
- **Transaction** – linking entries to transactions allows financial control and inventory control in a system of pseudo-accounting.

Stereotype Mapping: Mapping indicates how to deal with the resulting collections of instance:

- **Hierarchy** – treats the resulting collection as parents and children.
- **Sequence** – treats the resulting collection as ordered, allowing duplicates.

Aggregation: Aggregations on spatial, temporal, observation and composite dimensions are to be catered in the conceptual model.

The same example of a project at the Drakenstein municipality has been used in section 4.2.2 to compare this model with the reality.

4.2.2 Example Scenario

As an example, three situations, in the scenario of a water supply network extension of the Drakenstein Municipality, were generated and applied to the conceptual models. As the main focus of this thesis is the comparison between the ActionIT specifications and the existing information system, the investigation of these models could show the similarities and the shortcomings on both sides.

Scenario Part One: The idea generation of the network extension project.

Scenario Part Two: Surveys for project information gathering from social to geological nature.

Scenario Part Three: Invitation of external contractors to tender for the project.

4.2.2.1 Scenario Part One

Script	Through IDP, process objectives of improving living conditions were established. It was agreed the objective would be served well to supply a residential township with private water connections to each property.
Process Model	Project Formulation Portion of IDP budget allocated to improving living conditions. Project Registration Project Evaluation Project Prioritisation Project Approval Project Monitoring Project Closure
Enterprise Data Model	A project for the IDP process is created with Location the Drakenstein Municipality and Timepoint this financial year (or planning cycle). The municipality opens an account for the living conditions Deliverables as well as the extension of the water supply network. The municipality establishes Transactions , which link entries that were on a communal water supply, to a private water supply per household.

4.2.2.2 Scenario Part Two

Script	As part of the execution of the programme, the extension of the water supply network at locality Z was established. The feasibility of the project was due to a formally settled township with no private water supply. A survey to assess the information needed.
Process Model	<p>Project Formulation A project is formulated to do a social survey to establish the community involvement, as well as a geological survey to gather information for the design of the network extension.</p> <p>Project Registration The budget of the project is offset against the improvement of the living conditions, as is provided for in the IDP budget. The time planned for the project is registered. The legal, social and environmental deliverables are noted.</p> <p>Project Evaluation The project is evaluated for feasibility. Outstanding stakeholders and role players are identified and added to list of deliverables.</p> <p>Project Prioritisation The extension of the water supply network is ranked for priority in an absolute or relative sense.</p> <p>Project Approval The cost and other deliverables, is approved.</p> <p>Project Monitoring Project monitoring entails tracking time and money against network extension.</p> <p>Project Closure The survey project closure for the water supply network extension happens when the budget is spent, allocation time elapses or, ultimately, the survey is done.</p>
Enterprise Data Model	<p>A survey project for location Z to extend the water supply network with Location the Drakenstein Municipality and Timepoint this financial year.</p> <p>The project with balances for all the Deliverable accounts, like budget and time accounts, for monies and duration planned;</p>

	<p>Cadastral, Social and Geological surveys. Reports as deliverables.</p> <p>Monitoring entails offsetting the delivery of the deliverables against its account and the time and cost of the deliverables against the provisional entries that are linked together in transaction.</p> <p>A Transaction that incurs a cost will have an entry that offsets the available budget. Such entries, in particular, may additionally be classified according to any number of dimensions that are required to satisfy the reporting requirements, such as those set by the treasury.</p>
--	--

4.2.2.3 Scenario Part Three

Script	The local authority invites project proposals from developers to develop the extension to the water supply network.
Process Model	<p>Project Formulation The project is formulated, specifying the water network to be extended, the available subsidies and the professional team assembled.</p> <p>Project Registration The cost of the extension is offset against the current budget, cost and maintenance, and the service delivery added to the budget of ongoing projects.</p> <p>Project Evaluation The project is evaluated for feasibility. E.g. need for extra funding identified and funds sourced.</p> <p>Project Prioritisation Extension of water supply network project is ranked for priority in an absolute and relative sense.</p> <p>Project Approval Cost and other deliverables approved.</p> <p>Project Monitoring Project monitoring entails tracking time and money against delivery of the extended water supply project.</p>

	<p>Project Closure Extension of the water supply project closes when the budget is spent, allocated time elapses or the project finishes.</p>
Enterprise Data Model	<p>The extension of the water supply network with Location the Drakenstein Municipality and Timepoint this financial year.</p> <p>The project opens with balances for all the Deliverable accounts such as budget, time accounts for the monies and duration planned; subsidies and balances that indicate how much of the network is outstanding.</p> <p>Monitoring entails offsetting the delivery of the deliverables against its account, and the time and cost of the deliverable against the provision in entries that are linked together in a transaction.</p> <p>A Transaction that incurs a cost will have an entry that offsets the available budget. Such entries in particular may additionally be classified according to any number of dimensions that are required to satisfy the reporting requirements, such as those set by the treasury.</p>

4.2.3 UML Activity Diagram

The UML Activity Diagrams for the Drakenstein Municipality example can be seen in Appendix E. The diagrams for scenario two and three are shown. Scenario one is excluded, as very little information is shown in this scenario. The example corresponds well with the model on the behavioural aspects of the example.

4.2.4 UML Class Diagram

The UML Class Diagrams for the Drakenstein Municipality example can be seen in Appendix F. The diagrams for scenario two and three are shown. One is excluded as very little information is shown in the first scenario. The example does not correspond as well with the model on the static and structural aspects of the example. There are some areas of concern; these are the Dependence, Composite Structural Pattern and the Transaction where no information from the municipal side was found.

4.2.5 Summary on Applied ActionIT Example

The data generated from a project at the Drakenstein Municipality for the three scenarios and simulated with the ActionIT conceptual model. This was done to see how the existing information in real situations corresponds with the theoretical model. The process and enterprise data models generated UML Activity and UML Class diagram for the example scenario. This simplifies a scenario to a format that creates an opportunity for understanding municipal information systems and it is an excellent foundation to build and develop better solutions for information exchange.

The parallel between the example scenarios and the models is rather significant, as most of the information and data correspond well with the model's outline. In the case of the static, or structural (Enterprise Data Model), aspect of the model, there are still some areas on which no information from the municipality was found. This means that there are some minor discrepancies between what exists at the municipal level information systems and what ActionIT assumed would exist, according to the conceptual model.

5 Conclusion

To summarise, the user requirements from both the Drakenstein Municipality and the ActionIT specifications have been compared to see how the municipal information system complies with the needs, as seen by ActionIT. The correlations and discrepancies on both sides were shown; in order to provide a view of the state of information exchange, at the current moment, between the different spheres of government and, in comparison, that which is seen in ActionIT's development of data exchange specifications.

5.1 Project and Financial Data Exchange Standards

In all of the following cases of project and financial data exchange it was noted that the municipality does exchange information through physical methods. There is thus a need for a better system of information exchange in all the facets of the Drakenstein Municipality, as the physical exchange of information already in computerised format is time consuming and expensive.

5.1.1 Government Departments

Cases of physical information exchange between the municipality and government departments, which ActionIT does not deal with, are:

- Department of Housing.
- Department of Water Affairs and Forestry.
- Department of Land Affairs.
- Municipal District Municipality

5.1.2 Government Agencies and Parastatal Organisations

The ActionIT specifications do not include information on data exchange between the local municipality level and Government Agencies and Parastatal Organisations.

These are:

- Eskom
- Telkom
- Transnet
 - Spoornet
 - Metro Rail
- Statistics South Africa
- Development Bank of South Africa

5.1.3 Internal Municipal Systems

Project management and costing by departments are not directly linked to the central Treasury system. Scope for standardised data exchange per ActionIT exists.

5.2 GIS Exchange Standards

5.2.1 GIS Technology

GIS technology as an enabler for information exchange has merit. Standards like those to be developed by ActionIT are definitely required.

5.2.2 GIS Centralisation

The centralisation of the GIS system at the Drakenstein Municipality is in process. Standardisation of datasets and referencing is required. Linking of Planning and Engineering and Parks datasets are also required. ActionIT standards will be valuable.

5.3 Specialised Technical Design Systems

No direct data exchange of these systems (e.g. water network analysis) exists at the moment but might be needed in future.

5.4 Testing of ActionIT Conceptual Model in Municipal Environment

ActionIT's Conceptual Model was used to simulate a project situation from a municipal point of view. It proved to relate well to the scenario; the behavioural aspects performed well and complied with what was seen at municipal level. The static and structural aspects did have more areas of concern where it concerns implementation of the municipal scenario to the model.

As a final thought: The way forward looks like that of an interactive information exchange between all spheres of government in order to improve the decisions made at higher levels and to enhance the basic standard of living for the people, which the government serve.

6 References

6.1 Interviews

	Tel	Department	Date
Mr. Pierre de Villiers	(021) 807 4712	Eng. and Parks	Oct 2000 – Dec 2001
Mr. Deon du Plessis	(021) 807 4703	Eng. and Parks	April 2001 – Nov 2001
Ms. Delia Louw	(021) 807 4770	City Planning	Oct 2000 – Dec 2001
Mr. Willie Niewoudt	(021) 807 4709	Eng. and Parks	April 2001 – Dec 2001
Mr. Andre Abrams	(021) 807 4515	Treasury	April 2001
Mr. Attie Fourie	(021) 807 4548	Health	April 2001
Mr. Marcel Rose	(021) 807 4530	IT	April 2001
Mr. Hennie Brand	(021) 871 1911	Electrical	April 2001

6.2 Reference Documentation

1. Grady Booch, James Rumbach, Ivor Jacobson. The Unified Modelling Language. User Guide. Addison-Wesley, 1999.
2. MCA Urban and Environmental planners. IDP document, 1998
3. Vuna Healthcare Logistics Brochure, 2000
4. South African Government, www.gov.za
5. Lochner, F.C. Town Engineers Master Plan for Information Systems, Paarl Municipality, May 1998.
6. Marble, Duane F. Geographic information systems: an overview. Introductory readings in geographic information systems. London, Taylor and Francis. 1990
7. Zietsman, H.L. GIS and PC Arc/Info in a nutshell – an Introductory Course. Institute for Geographical Analysis, University of Stellenbosch, 1996.
8. Blignaut, J.H. Die Ontwikkeling van 'n Datamodel vir GIS ter Bevordering van Infrastruktuur. University of Stellenbosch, 1999.
9. Parsons, E. The essential guide to GIS. School of Geography; Kingston University, Surrey, 1995.
10. ActionIT.10.20.50. A Conceptual Model of Projects in Government. 6 March 2002.
11. ODSF. Research Framework to Define User Needs. ODSF for Government; 2000.
12. Pahl, Peter J. Lecture Notes. Technische Universitat Berlin. November 2001.
13. ActionIT.10.20.50. Generic Solutions. 16 August 2001.

14. ActionIT. Discussion document1_1 “Straw Dog”(preliminary solution concept). 9 March 2002.
15. Harold Kerzner. Project Management, A Systems Approach to Planning, Scheduling and Controlling. John Wiley & Sons, Inc. 2001.
16. Rory Burke. Project Management, Planning & Control Techniques. Stratford Upon Avon, Cape Town. 1999.
17. Daniel W. Halpin, Financial and Cost Concepts for Construction Management. John Wiley & Sons. 1985.
18. ActionIT.40.60.50. User Requirements. 16 August 2001
19. ActionIT.20.20.00. Projects in Government: User Requirements. 26 June 2001

6.3 Reference Software

1. Venus; Q-Data; PO Box 35015, Pretoria, South Africa; www.pqafrica.co.za.
2. Microsoft Windows 98 and higher; USA; www.microsoft.com.
3. MS Office, Microsoft Office v.98 and higher; USA; www.msoffice.com.
4. Novell Netware; Novell 1800 South Novell Place, Provo, Utah, USA; www.novell.com.
5. EasyPay; Prism Holdings Ltd.; Johannesburg, Gauteng, South Africa; www.prism.co.za.
6. Global Positioning System (GPS)
7. Vuna HealthCare Logistics; Thebe Company; DataCare, South Africa; www.vuna.co.za.
8. Supervisory Control and Data Acquisition (SCADA); Plessy.
9. Geographic Information System (GIS); SCF / GIMS, South Africa; www.gims.com.
10. Wadiso; GLS Engineering Software, Stellenbosch, South Africa; www.wadiso.com.
11. FleetFocus; Fintech.
12. AutoCAD; SCF / GIMS, South Africa; www.gims.com.

Appendix A: Projects at Drakenstein Municipality

A.1 Table A1: Overview of Municipal Processes

A.2 Processes in Engineering Department

A.1 Overview of Municipal Processes

Table A1.: Overview of Municipal Processes

		Strategic Process (Planning)	Functional Process (Design, Develop and Construct)	Operational Process (Manage & Maintenance)
		S	F	O
Treasury Department	1	<ul style="list-style-type: none"> Budget Allocation 	<ul style="list-style-type: none"> Billing Pre-paid Electricity System Management Provisioning 	<ul style="list-style-type: none"> Remunerations Debtor Management
Engineering and Parks Department	2	<ul style="list-style-type: none"> Infrastructure Strategic Planning Development Management 	<ul style="list-style-type: none"> Projects Management Projects Planning (Appendix A) Design 	<ul style="list-style-type: none"> Resources Management Process Management Plant management Road & Park Maintenance Fleet control Bulk Suppliers Interaction
Building Control Department	3	<ul style="list-style-type: none"> Building Regulating 	<ul style="list-style-type: none"> Approval of Building Plans Creation of new datasets 	<ul style="list-style-type: none"> Control of SAHRA Maintenance of Municipal Buildings
Planning Department	4	<ul style="list-style-type: none"> IDP Process Manage Cadastral Reference Data 	<ul style="list-style-type: none"> GIS Development Computerising Reference Data Housing Projects 	<ul style="list-style-type: none"> GIS Maintenance
Electrical Department	5	<ul style="list-style-type: none"> Electricity Supply Planning 	<ul style="list-style-type: none"> Extension to Electricity Grid Installation of Pre Paid Electricity 	<ul style="list-style-type: none"> Running of Electricity Grid
Health Department	6	<ul style="list-style-type: none"> Public Health Care Planning 	<ul style="list-style-type: none"> Gathering of Patient Information Family Planning Clinics Management AIDS Clinics Management 	<ul style="list-style-type: none"> Day to day Management Hospital and Clinics
Personnel Department	7	<ul style="list-style-type: none"> Resources Management Labour Union Policies Development 	<ul style="list-style-type: none"> Hiring and Selection Training and Education Labour Union Interaction 	<ul style="list-style-type: none"> Remunerations Personnel Safety and Health Management Performance Assistance

A.2 Processes in Engineering Department



DAMS, WATER SUPPLY, RESERVOIRS AND PROJECTS

PAARL MUNICIPALITY

Full Name of Local Authority

Water & Waste Section

WESTERN CAPE

Province

Contact person or person completing this form (in case the publisher needs more information). Name: H. BLIGNAUT
Tel: (021) 807 4725 Fax: (021) 872 8054 E-mail: hane@paarlmun.co.za

NB: • Please ensure the name of your local authority appears at the top of this page. • Please print clearly
• Please provide the information in the units requested. • Information supplied will be published as is.

2000-11-17

Date Completed

If you are unable to supply confirmed figures, please supply estimates, indicated =

Dams within the boundaries of the Local Authority

Name	Capacity (M ³)	Responsible Authority
<u>NANTES</u>		<u>PAARL</u>
<u>BETHEL</u>		<u>PAARL</u>
<u>VICTORIA</u>		<u>PAARL</u>

Water Supply

Storage Reservoirs

Average daily consumption Kilolitres - 1999 Kilolitres - 2000	Tariffs	Source of Supply	Distribution Loss	Name	Capacity (kl)
<u>48 475</u> <u>49 860</u>	<u>BULK</u> <u>117 cents/kl</u>	<u>CMC 92%</u> <u>NANTES/BETHEL 8%</u>	<u>20 %</u>	<u>LELIEFONTEIN (2)</u>	<u>136 000</u>
Total cost of water scheme 01/07/99 to 30/06/00 Total income 01/07/99 to 30/06/00 Surplus (S) or Deficit (D)				<u>COURTRAI (3)</u>	<u>19 600</u>
				<u>ENSLIN ST.</u>	<u>1 500</u>
				<u>BLAKE ST.</u>	<u>2 300</u>
				<u>GROENVLEI</u>	<u>1 500</u>
				<u>BO-LANG ST.</u>	<u>2 300</u>
				<u>AMSTELHOEF (2)</u>	<u>6 050</u>
<u>R 18 652 000</u>	<u>R 22 443 889</u>	<u>R 3 791 888 (S)</u>			

Do you have a water loss management programme? ☒ Yes ☐ No

Water reticulation projects for the financial year ending June 2001

Name/Description of Project	Estimated Starting Date	Estimated Completion Date	Estimated Cost
<u>DISTRICT AND ZONE WATER METERS</u>	<u>AUG. 2000</u>	<u>OCTOBER 2000</u>	<u>R200 000</u>
<u>FEASIBILITY STUDY: TREATMENT OF PAARL MOUNT. WATER</u>	<u>JUL. 2000</u>	<u>NOV. 2000</u>	<u>R100 000</u>
<u>NETWORK EXTENSION</u>	<u>AUG. 2000</u>	<u>OCT. 2000</u>	<u>R150 000</u>
<u>PRESSURE CONTROL</u>	<u>MAR 2001</u>	<u>JUN. 2001</u>	<u>R965 000</u>
<u>WATER DEMAND MANAGEMENT</u>	<u>SEPT. 2000</u>	<u>MAR 2001</u>	<u>R250 000</u>

Thank you for taking the time and trouble to complete this questionnaire carefully and post it back to us on time.



The Gaffney
Group

URGENT - We are on deadline - please phone Craig or Fawzia if you have any queries.

Tel: (011) 880-2114, Fax: (011) 880-2116, E-mail: ques@gaffney.co.za

Please complete and return urgently to The Gaffney Group, PO Box 812, Northlands, Sandton, 2116. Thank you.

Page

11



Stellenbosch University <http://scholar.sun.ac.za>
**NEW WATER, SEWER & ELECTRICITY CONNECTIONS,
ROADS & INFRASTRUCTURE PROJECTS**

Infrastructure & Capital
Projects Section

PM
Full Name of Local Authority

Province

Contact person or person completing this form (in case the publisher needs more information). Name: H. B.

Tel: () Fax: () E-mail: ()

- NB: • Please ensure the name of your local authority appears at the top of this page. • Please print clearly
• Please provide the information in the units requested. • Information supplied will be published as is.

Date Completed

Number of new Sewer, Water and Electricity connections 1 July 1999 to 30 June 2000

Sewer	% annual growth	Water	% annual growth	Electricity	% annual growth
446 NEW	2,5 %	1246 NEW	6,6 %	(Eek)	(Eek)

Roads within the boundary of the Local Authority

	Length Maintained	Percentage Maintained by			Total cost of Roads Maintenance 01/07/99 to 30/06/00
		Local Authority	Private Contractors	Other Authorities	
Tarred Roads	328 km	97 %	3 %	0 %	R 6613 085
Gravel Roads (not tarred)	15 km	100 %	0 %	0 %	R 46 000

Roads and stormwater projects for the financial year ending June 2001

Name/Description of Project	Estimated Starting Date	Estimated Completion Date	Estimated Cost
RECONSTRUCTION OF MEAKER ST.	SEP 2000	JAN. 2001	1701 000
STORMWATER UPGRADING PROJECTS	OCT. 2000	APRIL 2001	1 000 000
STORMWATER MASTER PLAN + MANAGEMENT SYSTEM	JUN. 2000	FEB. 2001	447 000
GENERAL STREET CONSTRUCTION PROJECTS	AUG 2000	JAN 2001	300 000

Bulk services projects for the financial year ending June 2001

Name/Description of Project	Estimated Starting Date	Estimated Completion Date	Estimated Cost
(Reeds given)			

Other municipal infrastructure projects for the financial year ending June 2001

List those not already mentioned – electricity, water & sewer reticulation project details are required on pages 10, 11 & 12 respectively

Name/Description of Project	Estimated Starting Date	Estimated Completion Date	Estimated Cost
(Reeds given)			



The Gaffney
Group

URGENT – We are on deadline – please phone Craig or Fawzia if you have any queries.

Tel: (011) 880-2114, Fax: (011) 880-2116, E-mail: ques@gaffney.co.za

Please complete and return urgently to The Gaffney Group, PO Box 812, Northlands, Sandton, 2116. Thank you.

Page

13



PARKS & GROUNDS, SPORTS & LEISURE FACILITIES AND PROJECTS

Parks & Recreation
Section

Full Name of Local Authority

Province

Contact person or person completing this form (in case the publisher needs more information). Name:

Tel: () Fax: () E-mail:

NB: • Please ensure the name of your local authority appears at the top of this page. • Please print clearly
• Please provide the information in the units requested. • Information supplied will be published as is.

Date Completed

Number of units of public space

Public open space Total hectares	Number of street trees	Under 5 ha	5 - 10 ha	10 - 15 ha	15 - 100 ha	Over 100 ha
UNIKWAT	UNIKWAT	—	—	—	—	—

Parks, Gardens, Cemeteries and Related Facilities

No. of Parks	No. of Gardens	No. of Cemeteries	No. of Crematoriums	Other (please specify)
104	39	2	0	

Sports, Recreation and Leisure Facilities

	Local Authority	Private		Local Authority	Private		Local Authority	Private
Rugby fields	12		Gymnasiums	0		Red community centres	4	5
Soccer fields	10		Golf courses	1		Halls	4	2
Cricket fields	9		Mashie courses	0		Club/change rooms	5	0
Indoor cricket fields	0		Athletic tracks	3		Amphitheatres	0	
Hockey fields	6		Model aeroplane fields	0		Scouts/Guides/Voortrekkers	1	
Indoor hockey fields	0		BMX tracks	2		Horse-riding	0	
Baseball/Softball pitches	0		Rollerskating/blading rinks	0		Swimming pools	3	
Handball fields	0		Ice rinks	0		Water sport (dams)	0	
Stadia (soccer/rugby)	3		Pistol-shooting ranges	1		Water sport (beaches)	0	
Stadia (athletics/cycling)	3		Archery ranges	1		Water sport (river trails)	0	
Tennis courts	16		Jukskei	10		Dams (not for sport)	3	
Squash courts	2		Bowling greens	2		Bird sanctuaries	1	
Badminton courts	0		Martial arts facilities	0		Nature parks/reserves	1	
Basketball courts	4		Boxing facilities	0		Botanical gardens	0	
Netball courts	6		Trimparks	1		Zoological gardens	0	
Table Tennis	0		Adventure playgrounds	0		Game reserves	0	
Volleyball	0		Play-parks			Other (specify) (HABU 2 ETUM)	1	

Parks & Grounds, Sports & Leisure projects for the financial year ending June 2001

Name/Description	Estimated Starting Date	Estimated Completion Date	Estimated Cost
Daljezalet Sport Stadium - Drainage system	10/11/2000	31/1/2001	R 60 000,00
Upgrading Cricket Pitches	20/10/2000	30/11/2000	R 20 000,00
Replace filter and paving at Swimming Pools	20/11/2000	25/2/2001	R 220 000,00
Building Wall of Remembrance at Cemetery	20/11/2000	20/3/2001	R 170 000,00



The Gaffney
Group

URGENT - We are on deadline - please phone Craig or Fawzia if you have any queries.

Tel: (011) 880-2114, Fax: (011) 880-2116, E-mail: ques@gaffney.co.za

Please complete and return urgently to The Gaffney Group, PO Box 812, Northlands, Sandton, 2116. Thank you.

Page

15



PARKS & GROUNDS - FINANCIAL, HORTICULTURAL REQUISITES AND PERSONNEL

Parks & Recreation
Section

Full Name of Local Authority

Province

Contact person or person completing this form (in case the publisher needs more information). Name: _____

Tel: () _____ Fax: () _____ E-mail: _____

NB: • Please ensure the name of your local authority appears at the top of this page. • Please print clearly
• Please provide the information in the units requested. • Information supplied will be published as is.

Date Completed

Financial - Expenditure 1 July 1999 to 30 June 2000

Budgetary provision		Major plant purchased				Other (specify)
Capital	Operating Expenses	Tractors	Sit-on mowers	Lorries/Bakkies	Earthmoving Equipment	
R	R	R	R	R	R	R
						R
						R
						R
Minor plant purchased						Other (specify)
Hand-operated grass cutters	Trimmers	Sweepers	Water tankers	Pumps	Complete irrigation systems	Tools and loose gear
R	R	R	R	R	R	R
						R
						R
						R

Financial - Income 1 July 1999 to 30 June 2000

Hire of facilities	Admission fees	Nature Reserve Nursery sales of plants	Cremations & Burials	Other Swimming Pools	Income as % of expenditure
R 84925,84	R 169796,70	R 21209,44	R (unknown)	R 60369,75	— %

Horticultural requisites per annum

Number of municipal nurseries	Number of Trees	Number of Shrubs	Seeds	Turf	Soil
1	191514	7408	kg	m ²	m ²
Fertiliser	Pesticides	Other Groundcover	Value of stock and propagated plants	Losses incurred during production	Actual deficit (D) or surplus (S)
ton R	R	R 3486	R 815140,00	R	R

not going to complete because not clear category of Sport/Horticulture
Some people is semi-skilled and fall in Parks and Grounds Personnel

Management	Horticulture	Sport Recreation	Skilled (Technicians)	Semi-skilled (drivers, machine operators)	Unskilled	Nature Reserve Other OFG
R			R			R

Thank you for taking the trouble to complete this questionnaire carefully.



The Gaffney
Group

URGENT - We are on deadline - please phone Craig or Fawzia if you have any queries.

Tel: (011) 880-2114, Fax: (011) 880-2116, E-mail: ques@gaffney.co.za

Please complete and return urgently to The Gaffney Group, PO Box 812, Northlands, Sandton, 2116. Thank you.

Page

16



PARKS & GROUNDS - FINANCIAL, HORTICULTURAL REQUISITES AND PERSONNEL

Parks & Recreation
Section

Full Name of Local Authority

Province

Contact person or person completing this form (in case the publisher needs more information). Name: _____

Tel: (_____) _____ Fax: (_____) _____ E-mail: _____

- NB: • Please ensure the name of your local authority appears at the top of this page. • Please print clearly
• Please provide the information in the units requested. • Information supplied will be published as is.

Date Completed

Financial - Expenditure 1 July 1999 to 30 June 2000

Budgetary provision		Major plant purchased				Other (specify)
Capital	Operating Expenses	Tractors	Sit-on mowers	Lorries/Bakkies	Earthmoving Equipment	
R 750 000	R 993 080	R 237 120	R —	R 376 960	R —	R 934 800
Minor plant purchased						Other (specify)
Hand-operated grass cutters	Trimmers	Sweepers	Water tankers	Pumps	Complete irrigation systems	Tools and hose gear
R 27018	R 39148	R —	R —	R —	R —	R —

Financial - Income 1 July 1999 to 30 June 2000

Hire of facilities	Admission fees	Nursery sales	Cremations & Burials	Other	Income as % of expenditure
R —	R —	R —	R —	R —	

Horticultural requisites per annum

Number of municipal nurseries	Number of Trees	Number of Shrubs	Seeds	Turf	Soil
			kg	m ³	m ³
Fertiliser	Pesticides	Other	Value of stock and propagated plants	Losses incurred during production	Actual deficit (D) or surplus (S)
ton	R	R	R	R	R

Parks and Grounds Personnel

Management	Horticulture	Recreation	Skilled (Technicians)	Semi-skilled (drivers, machine operators)	Unskilled	Other

Thank you for taking the trouble to complete this questionnaire carefully.



The Gaffney
Group

URGENT - We are on deadline - please phone Craig or Fawzia if you have any queries.

Tel: (011) 880-2114, Fax: (011) 880-2116, E-mail: ques@gaffney.co.za

Please complete and return urgently to The Gaffney Group, PO Box 312, Northlands, Sandton, 2116. Thank you.

Page

16

Full Name of Local Authority

Province

Contact person or person completing this form (In case the publisher needs more information) Name:

Tel: () Fax: () E-mail:

NB: • Please ensure the name of your local authority appears at the top of this page. • Please print clearly
• Please provide the information in the units requested. • Information supplied will be published as is.

Date Completed _____

Major MUNICIPAL capital projects PLANNED FOR THE NEXT TEN YEARS, including capital infrastructure projects e.g. Roads and Stormwater, Bulk Services, Water Reticulation, Sewer Reticulation, Electricity Reticulation and other projects. Only list those not already mentioned. Details on projects for the year ending June 2001 are requested on pages 2, 7, 10–13 and 15)

[illegible]

Major PRIVATELY funded capital projects and developments in progress or planned for the next 10 years

[illegible]

Your efforts in completing this questionnaire are most appreciated. Please return it urgently – we are on deadline. Thank you



The Gattney
Group

URGENT – We are on deadline – please phone Craig or Fawzia if you have any queries.

Tel: (011) 880-2114, Fax: (011) 880-2116, E-mail: ques@gaffney.co.za

Please complete and return urgently to The Gaffney Group, PO Box 812, Northlands, Sandton, 2116. Thank you.



MUNICIPAL & PRIVATELY FUNDED CAPITAL PROJECTS

Infrastructure & Capital
Projects Section

Full Name of Local Authority

Province

Contact person or person completing this form (in case the publisher needs more information). Name:

Tel: () Fax: () E-mail:

- NB: • Please ensure the name of your local authority appears at the top of this page. • Please print clearly
• Please provide the information in the units requested. • Information supplied will be published as is.

Date Completed

Major MUNICIPAL capital projects PLANNED FOR THE NEXT TEN YEARS, including capital infrastructure projects
e.g. Roads and Stormwater, Bulk Services, Water Reticulation, Sewer Reticulation, Electricity Reticulation and other projects.
(Only list those not already mentioned. Details on projects for the year ending June 2001 are requested on pages 2, 7, 10-13 and 15)

Name/Description	Estimated Starting Date	Estimated Completion Date	Estimated Cost
RECONSTRUCTION OF STREETS	JUL 2002	MAR 2005	2 943 875
PROJECT 2 EXTERNAL STORMWATER	"	" 2005	2 909 000
GENERAL STREET CONSTRUCTION	JUL 2002	JUN 2005	604 000
TRANSPORTATION MASTER PLAN	JUL 2002	JUN 2004	1 000 000
WATER TREATMENT WORKS: PAARL MOUNTAIN	JUL 2001	APR 2003	7 000 000
REPLACEMENT OF BULK PIPELINES: PAARL MOUNTAIN	JUL 2001	JUN 2004	3 500 000
SEWER NETWORK REPLACEMENT	JUL 2001	JUN 2010	5 000 000

Major PRIVATELY funded capital projects and developments in progress or planned for the next 10 years

Name/Description	Estimated Starting Date	Estimated Completion Date	Estimated Cost
(David) - Weyberg			

Your efforts in completing this questionnaire are most appreciated. Please return it urgently - we are on deadline. Thank you



The Gaffney
Group

URGENT - We are on deadline - please phone Craig or Fawzia if you have any queries.

Tel: (011) 880-2114, Fax: (011) 880-2116; E-mail: ques@gaffney.co.za

Please complete and return urgently to The Gaffney Group, PO Box 812, Northlands, Sandton, 2116. Thank you.



SEWAGE & WASTE DISPOSAL AND PROJECTS

Stellenbosch University <http://scholar.sun.ac.za>

Water & Waste Section

Full Name of Local Authority

Province

Contact person or person completing this form (in case the publisher needs more information). Name:

Tel: (021) 887-4702 Fax: (021) 872 8054 E-mail: david@poorhouse.co.za

NB: • Please ensure the name of your local authority appears at the top of this page. • Please print clearly
• Please provide the information in the units requested. • Information supplied will be published as is.

Date Completed

Sewage Disposal

Disposal Works			Total cost 01/07/99 to 30/06/00	Total Income 01/07/99 to 30/06/00	Surplus (S) or Deficit (D)
Name	Process used	ML/d	9 536 806	3 138 000	6 398 806
PAARL	Bio Filtering + Activated Sludge	35 ML			

Tick appropriate boxes. ☐ a) Partly sewered ☒ b) Completely sewered ☐ c) On-site disposal

Average daily flow 25 ML/d.

Sanitation tariffs per month

	Sewage Disposal	Tanker Service	Nightsoil (buckets)	Rubbish Removal
Dwelling houses	R	R	R	R 64
Flats	R	R	R	R 64
Commercial	R	R	R	R 64
Light industries	R	R	R	R 64
Heavy industries	R	R	R	R 64
Other	R	R	R	R 64

Average volume of refuse removal per month 3 000 tons/ 8 000 m³

Solid Waste Disposal Sites within the boundaries of the Local Authority (if none, state location of nearest site and number of km away)

Name	Location	Responsible Authority
Ben Nene - Transkei	Distilling Street	

Sewage reticulation & disposal projects for the financial year ending June 2001

Name/Description of Project	Estimated Starting Date	Estimated Completion Date	Estimated Cost
Excavated Well-site - Solid waste Dump Site	Aug 2000	Dec 2000	R 1 000 000



The Gaffney Group

URGENT - We are on deadline - please phone Craig or Fawzia if you have any queries.

Tel: (011) 880-2114, Fax: (011) 880-2116, E-mail: ques@gaffney.co.za

Please complete and return urgently to The Gaffney Group, PO Box 812, Northlands, Sandton, 2116. Thank you.



PM
Full Name of Local Authority

Province

Contact person or person completing this form (in case the publisher needs more information). Name: H.B.

Tel: () Fax: () E-mail:

NB: • Please ensure the name of your local authority appears at the top of this page. • Please print clearly
• Please provide the information in the units requested. • Information supplied will be published as is.

Date Completed

Sewage Disposal (David)

Disposal Works			Total cost 01/07/99 to 30/06/00	Total Income 01/07/99 to 30/06/00	Surplus (S) or Deficit (D)
Name	Process used	MI/d			

Tick appropriate boxes. ☐ a) Partly sewered ☐ b) Completely sewered ☐ c) On-site disposal

Average daily flow _____ MI

Sanitation tariffs per month

	Sewage Disposal	Tanker Service	Nightsoil (buckets)	Rubbish Removal
Dwelling houses	R 160, 54 / TOILET / YEAR	R	R	R
Flats	R 211, 71 / TOILET / YEAR	R	R	R
Commercial	R + BASIC	R	R	R
Light industries	R 353, 37 / TOIL / YEAR	R	R	R
Heavy industries	R FORMULA I.T.O.	R	R	R
Other	R 353, 37 / TOIL / YEAR + BASIC	R	R	R

Average volume of refuse removal per month _____ tons/ _____ m³ (David)

Solid Waste Disposal Sites within the boundaries of the Local Authority
(if none, state location of nearest site and number of km away) (David)

Name	Location	Responsible Authority

Sewage reticulation & disposal projects for the financial year ending June 2001

Name/Description of Project	Estimated Starting Date	Estimated Completion Date	Estimated Cost
NETWORK EXTENSION	AUG. 2000	SEPT. 2000	100 000
NETWORK REPLACEMENT	AUG. 2000	FEB. 2001	500 000
NETWORK REPLACEMENT SPLITTING	FEB. 2001	MAY 2001	800 000
COMPLETION OF MASTER PLAN	JUL. 2000	FEB. 2001	250 000
FAIRYLAND NETWORK EXTENSION	FEB. 2001	JUNE 2001	350 000



The Gaffney
Group

URGENT - We are on deadline - please phone Craig or Fawzia if you have any queries.

Tel: (011) 880-2114, Fax: (011) 880-2116, E-mail: ques@gaffney.co.za

Please complete and return urgently to The Gaffney Group, PO Box 812, Northlands, Sandton, 2116. Thank you.

Appendix B: GIS Data Set Fields

B.1 GIS Data Set Fields Engineering

B.2 GIS Data Set Fields Electrical

B.3 Types of Services/Infrastructure Providers and Information
Requirement

B.1 GIS Data Set Fields – Engineering

Path	Directory	No	Description	Sets	Sets required	Notes	Priority of Sets Required
GIS/						Stellenbosch University http://scholar.sun.ac.za	Low, Medium or High
Pubdata	GIS	1	Admin Boundaries	Municipal		census, voters role	
				Farm			
				Erven		erf numbers, ownership, extent, zoning etc.	
					Magisterial		
					Winelands Regional Council		
					Suburbs		
					Servitudes for Eng. Services		
					Infringement Agreements		
	GIS	2	Streets	Curbs		lines, type	
				Centre Lines			
					Road Classification	Road Transport Authorities Network	
					Road Reserves	and Town Planner's design on future road reserves	
					Bridges		
					Ducts	Municipal, Telkom	
					Pavements	surface type	
					Parking	no. of bays, size, surface	
					Road Signs	traffic, advertisements (illuminated and sidewalks)	
					Traffic Calming	mini circles, speed bumps (type), ped crossings etc.	
					Taxi Ranks	extent, density	
					Bus Routes	routes, stops	
					Disabled Ramps		
					Hawkers	site, size	
	GIS	3	Rail	Main Line			
					Side Lines & Sidings		
	GIS	4	Water	Rivers		flood lines, water quality, pumping rights	
				Dams		capacity, water quality, dam safety inspection, levels	
				Reservoirs		capacity	
				Pipelines			
				Valves			
				Hydrants			
				Meters			
					Pumps		
					Boreholes		
	GIS	5	Storm Water	Pipelines			
				Manholes			
				Catchpits			
				Grid Inlets			
					Rivers	flood line	
					Canals	capacity, type	
					Furrows	capacity, type	
					Dams	capacity, inlet & outlet	
					Retention Dams	capacity, inlet & outlet	
					Farm Dams	capacity	

	GIS	6	Sewerage	Pipelines	Stellenbosch University http://scholar.sun.ac.za	
				Manholes		
					waste water treatment works	
	GIS	7	Cleansing	Areas / Zones		
					Routes	
					Refuse Bins	freestanding, pole, skips, bottle banks, paper banks
					Dump Sites	current and old
					Transfer Station	
	GIS	8	Parks	Sports Fields		Municipality, schools
				Nature Reserves		Boundary, Fire Blocks, Trails
					Cemetery	
					Arboretum	
					Bird Sanctuary	
					Street Trees	
					Pavements / Islands	surface, under irrigation
					Public Open Spaces	
					Irrigation	computerised, manual
					Berg River Banks	maintenance programme
					Infringement Agreements	
					Contracts / Rentals	eg Golf Course
	GIS	9	Contours	Various		
	GIS	10	1:50 000	Roads		Vector Images
				Rivers		Vector Images
				Cadastral		Vector Images
				Contours		Vector Images
	GIS	11	Aerial Photos	Paarl 1:30 000, MBekweni 1:6000 ABW -1:6000		new photography planned for Jan 2000
	GIS	12	Geological		Soil Types	
					Underground Water	
	GIS	13	Municipal Prop.		Buildings	clinics, pub toilets, libraries, civic centre, town hall, offices, contracts / rentals (eg. golf course)
	GIS	14	Socio-Economic		Schools,Hosp,Pol,Fire etc.	
	GIS	15	Interest		Tourism,Monuments etc.	
	GIS	16	Business		KWV,Wine Route,Farms etc	
	GIS	17	Source Inspection (Priv. Prop.)			
	MIS	17	Roads			Pavement Management
	MIS	18	Stormwater			Stormwater Management
	MIS	19	Water			Water Management
	MIS	20	Sewerage			Sewerage Management
	MIS	21	Bridges			
	MIS	22	Waste Water	Meter Readings Water Quality		
	MIS	23	Cleansing	Waste Removal		
	MIS	24	Fleet Control			Fleet Focus

	Records	26	Sport	Facility Usage	Stellenbosch University http://scholar.sun.ac.za	
	Records	27	Cemetery			
	Records	28	Contracts		From July 99 onwards	
	Records	29	Plan Index			
	Records	30	Sub-Divisions			
	CAD	31	Plans	As-Built Plans		
				Designs		
				GIS Prepared		

ALIAS	TYPE	WIDTH	DECIMAL	DEFINE
ID	FIELD CHAR	13	0	Min. Max.
ID KODE	FIELD CHAR	5	0	
TIPE OPPER	FIELD CHAR	3	0	
KLASSIFI P	FIELD CHAR	5	0	
KLASSIFI O	FIELD CHAR	5	0	
DIKTE PLAV	FIELD DECIMAL	11	3	25mm 100mm
DIKTE KROO	FIELD DECIMAL	11	3	100mm 200mm
TIPE KROON	FIELD CHAR	4	0	
DIKTE STUT	FIELD DECIMAL	11	3	100mm 200mm
TIPE STUT	FIELD CHAR	4	0	
LANE LINKS	FIELD DECIMAL	11	0	1 4
LANE REGS	FIELD DECIMAL	11	0	1 4
DWARSVAL L	FIELD DECIMAL	11	3	2% 4%
DWARSVAL R	FIELD DECIMAL	11	3	2% 4%
RANDST LIN	FIELD CHAR	4	0	
RANDST REG	FIELD CHAR	4	0	
VERKEER 12	FIELD DECIMAL	4	0	
WYDTE PADR	FIELD DECIMAL	11	3	8m 32m
MID EILAND	FIELD CHAR	11	0	
SYPAD ID	FIELD CHAR	13	0	
ERF ID	FIELD DECIMAL	13	0	1 1000000
ERF INGANG	FIELD CHAR	13	0	
BOOG ID	FIELD CHAR	13	0	
BRUG KASDU	FIELD CHAR	13	0	
RIVIER KAN	FIELD CHAR	13	0	
PYP ID	FIELD CHAR	13	0	
TAAK ID	FIELD CHAR	13	0	
MANGAT ID	FIELD CHAR	13	0	
VANGPUT ID	FIELD CHAR	13	0	
POMP ID	FIELD CHAR	13	0	
KLEP ID	FIELD CHAR	13	0	
X T BUIG R	FIELD CHAR	13	0	
STORMW INL	FIELD CHAR	13	0	
STORMW UIT	FIELD CHAR	13	0	
PYP ENDSTU	FIELD CHAR	13	0	
AANSLUITIN	FIELD CHAR	13	0	
GROOTM WAT	FIELD CHAR	13	0	
DAM RESER	FIELD CHAR	13	0	
CHLORINEER	FIELD CHAR	13	0	
TIPE	FIELD CHAR	4	0	
KLAS	FIELD CHAR	4	0	
BINNE DIA	FIELD DECIMAL	11	3	10mm 2000mm
BUTE DIA	FIELD DECIMAL	11	3	10mm 2000mm
BEGINHOOGT	FIELD DECIMAL	11	3	60m 2000m
ENDHOOGTE	FIELD DECIMAL	11	3	60m 2000m
LENGTE	FIELD DECIMAL	11	3	
TIPE KOPPE	FIELD CHAR	4	0	
MAKS KAPAS	FIELD DECIMAL	11	3	
AANTAL AAN	FIELD DECIMAL	11	0	
VERW VL VO	FIELD DECIMAL	11	3	
TOT AANSL	FIELD DECIMAL	11	0	
GRONDTOEST	FIELD CHAR	4	0	
STRAATSEKS	FIELD CHAR	13	0	
BESKRYWING	FIELD CHAR	6	0	
OORSAAK	FIELD CHAR	4	0	
VLOEI GEME	FIELD DECIMAL	11	3	
DRUK GEMEE	FIELD DECIMAL	11	3	
INSPEK RES	FIELD CHAR	4	0	
RADIUS	FIELD DECIMAL	11	3	
DELTAHOEK	FIELD DECIMAL	11	3	
TANGENSLEN	FIELD DECIMAL	11	3	
BEGIN BOOG	FIELD DECIMAL	11	3	
END BOOG K	FIELD DECIMAL	11	3	
KANTING	FIELD DECIMAL	11	3	
OORGANGSB	FIELD DECIMAL	11	3	
NAAM	FIELD CHAR	4	0	
TOPWYDTE	FIELD DECIMAL	11	3	
BODEMWYDTE	FIELD DECIMAL	11	3	
GEMID DIEP	FIELD DECIMAL	11	3	
TIPE BESKE	FIELD CHAR	4	0	
GEM VLOEDV	FIELD DECIMAL	11	3	
AANTAL SPA	FIELD DECIMAL	11	0	
SPANLENGTE	FIELD DECIMAL	11	3	
MAKS HOOGT	FIELD DECIMAL	11	3	
TIPE MATERI	FIELD CHAR	4	0	

ALIAS	TYPE	Stellenbosch University http://scholar.sun.ac.za	Min.	Max.	DEFINE
VLOED ONTW	FIELD DECIMAL	11	3		
WYDTE GEPL	FIELD DECIMAL	11	3		
TOPHOOGTE	FIELD DECIMAL	11	3	60m	2000m
BODEMHOOGT	FIELD DECIMAL	11	3	60m	2000m
FABRIKAAT	FIELD CHAR	4	0		
MOTORSPOED	FIELD DECIMAL	11	3		
MODEL	FIELD CHAR	10	0		
DRYWING	FIELD DECIMAL	11	3		
BO ONDER G	FIELD CHAR	4	0		
AANTAL FAS	FIELD DECIMAL	11	0	1	3
IMPELL GRO	FIELD DECIMAL	11	3		
MAKS WATER	FIELD DECIMAL	11	3		
MIN WATER	FIELD DECIMAL	11	3		
GROOTTE	FIELD DECIMAL	11	3		
AANTAL SIL	FIELD DECIMAL	11	0		
TIPE GEBRU	FIELD CHAR	4	0		
WATERMETER	FIELD CHAR	16	0		
WATER ST R	FIELD CHAR	11	0		
VERWAGTE V	FIELD DECIMAL	11	3		
TIPE WATER	FIELD CHAR	4	0		
AANTAL DAK	FIELD DECIMAL	11	0		
TIPE OOREE	FIELD CHAR	11	0		
PRIFAAT GE	FIELD CHAR	11	0		
BEGIN ID	FIELD CHAR	13	0		
END ID	FIELD CHAR	13	0		
DATUM ONT	FIELD DATE	12	0		
DATUM VOLT	FIELD DATE	12	0		
DEKSEL MAT	FIELD CHAR	15	0		
DEKSEL GRO	FIELD DECIMAL	11	3		
PYP DIA	FIELD DECIMAL	10	3	10mm	2000mm

B.2 GIS Data Set Fields – Electrical

Substation

Id		Num	
Date_time		Date/time	
Code	66S DistS MainS PrivS TrfS	String	10
Gridnr.		String	10
Erfnr.		Num	10
Sub_name		Alfa	30
Feeder_sub		String	10
Street		Alfa	30
Constution	Building Minisub Camp Open	Alfa	10
Fault		String	10
Busse_#		String	10
Earth		String	10
Date_read		Date	
Date_comm.		Date	
Contractor		Alfa	30
Date_serv.		Date	
Electrician		Alfa	30
Lt_legs		Num	10
Claimnr.		String	20

Transfomator

Id		Num	
Date_time		Date/time	
Code	11T ; 66T ; PrivT	String	10
GridNr.		String	10
Trf_kVA		Existing	

Trf_setting	1 (0) 2 (2,5) 3 (5) 4 (7,5) 5 (10)	String	10
Fabric		Num	20
Earth		String	10
Date_read		Date	
Bush	Open Close	Alfa	10
Date_serv		Date	
Current(Amp)		String	10
Date_read		Date	

Switches

Id		Num	
Date_time		Date	
Code	Existing		
Gridnr.		String	10
Rur_Nr.		String	10
Fabric		Alfa	20
Isolation		String	10
Type	RMU TOF ISOL OCB AIR AUTO	Num	10
Left_Leg		String	10
Right_leg		String	10
Fuse(AMP)		String	10
Date_comm.		Date	
Electrician		Alfa	30
Date_serv.		Date	
Electrician		Alfa	30

B.3 Types of service / infrastructure providers and information requirements

Table B3: Types of services / infrastructure providers and information requirements [ActionIT¹⁴]

Category	Examples	Key information requirements
Point-based service providers	Hospitals & clinics Police & emergency services Education facilities Retail facilities Administrative services	<ul style="list-style-type: none"> Identifying new growth areas Catchment area analysis Customer profiling Identifying areas that are poorly served
Transport & logistics service providers	Passenger transport services Postal services Freight delivery services	<ul style="list-style-type: none"> Address matching Network analysis (shortest path, routing and scheduling) Coverage analysis
Transport infrastructure providers	Road & rail infrastructure provision	<ul style="list-style-type: none"> Identifying new growth areas Network and spatial interaction analysis Car ownership forecasts
Providers of bulk infrastructure (reservoirs and treatment plants)	Bulk water & electricity provision Refuse & sewerage treatment facilities	<ul style="list-style-type: none"> Future demand predictions per bulk catchment area Categorisation of business & household users
Providers of local reticulation services (engineering services)	Township development Settlement upgrading	<ul style="list-style-type: none"> Land suitability analysis Identifying new growth areas Service backlog estimation Household affordability estimates



VUNA VISION

WE KEEP YOU UP-TO-DATE

VUNA HEALTHCARE LOGISTICS VOLUME 2 SEPTEMBER 2000

EDITORIAL

As can be seen from the contents of the newsletter, all Depots are working in overdrive, and in-service training is going on all the time.

I was very shocked to hear about the death of Leon Christodoulou, who was involved in the drafting of the Support Staff Unit Standards, on which our in-service training is based.

I was fortunate to have been able to meet with him on many occasions in regard to training, and was impressed with his broad knowledge of pharmacy matters and his ideal to have all support staff trained to become part of the pharmaceutical team. I hope that the Council will be able to replace him with someone as dedicated and capable.

Due to shortage of space, we cannot introduce you to all the personalities at the Corporate Office at once, but we will do so in future newsletters.

The five year contract between the Northern Province department of Health and Vuna comes to an end in October, and Vuna and the management and staff of the Depot must be congratulated for their hard work, dedication and successful completion of this period.

They can be proud of the high standard that has been achieved during this time.

Let us hear from our clients in the Northern Province – what do you feel about the service of the Depot during the past 5 years, what were the problems – if any, or what could have been done to improve the service? Only if you respond will the Depots know what you – the clients – think and what you would like to be done to improve the service.

A word of thanks to the Tutors at our Depots who are involved in the in-service training, although few people realise the amount of work you are doing or its importance, it is still appreciated, and to the students – keep up the good work – it is a pleasure to work with people with your motivation and positive attitude. Use the newsletter to let us have your views as well.

Thank you to all of you who sent in articles – without your input this newsletter would not be possible. Please continue with your contributions.

Greetings from the Team.
Almero Mathews.

PROVINCIAL TRAINING IN THE NORTHERN PROVINCE

ESSENTIAL DRUG PROGRAMME:

This training started in 1997 after the release of the National Drug Policy. Our initial objective of training at least one professional nurse in Effective Prescribing and Drug Supply Management has been achieved, additional training will be done when the need arises.

This year the province will be implementing and reviewing important aspects of training; that is, the correct usage of stock cards at clinics, and the use of Standard Treatment Guidelines in prescriptions. Stock cards are needed at clinics as they form part of the Treasury Requirements. Every item (pharmaceuticals and surgical sundries) kept at clinics and health care centres must be controlled on the stock card.

Training in DSM was done in the Lowveld Region at Nkhensani Hospital in March. Twenty nine (29) people were trained. In the Southern Region four workshops were held from the 27th March to the 14th April at Hlatlolanang, and 49 people were trained in both Effective Prescribing and Drug Supply Management. I would like to thank the following trainers for this years' training: Eric Lungwane (Nkhensani Hospital), Nancy Mothoa, Leah Makofane, Pauline Manaka, Diana Moima, Melina Maile and Meriam Mokgoadi.

Another DSM training session is planned for July.

PERFORMANCE MANAGEMENT:

The Human Resource Development and Training division of the Department trained eight Depot staff members in March and April. I would like to thank Mr Mathikhi and Ms Alinah Tsiligi for their excellent workshops.

Compiled by: M.E. Rasengane

WHO'S WHO AT THE CORPORATE OFFICE

Keith McCullough -
Chief Executive Officer

Bada Pharasi -
Managing Director and Deputy CEO

Renier Botha -
Programs Manager: Hospitals & Clinic
Systems (H & C)

Santa Botha -
Office Support: H & C

Sandy Brenner -
Creditor's Coordinator

Dave Higginson -
Contract Accountant

Carine Jonker -
Project Manager: VHL- Datacare

Anita Kara -
Bookkeeper.

Sydney Khumalo -
Communication Project Manager.

Dorcas Ledwaba -
Cleaner.

Saadia Luckay -
Human Resources & Project Manager

Esther Mashego -
Project Manager: H & C

Joy Mjokozeli -
Receptionist.

Carol Nobela -
Project Manager: H & C

Paul Ntuli -
Driver & Messenger

Charlene Pienaar -
Temporary Creditor's Clerk

Antoinette Purchase -
Financial Assistant

Lynne Ras -
Project Manager: VHL.

Ernst Sigl -
Project Manager: H & C

Elinah Twala -
Cleaner

Niki Yui -
Account Coordinator.

CONFERENCE

The dates and venue for the Mpumalanga Pharmaceutical Services conference has been finalised, and will be held on the 25th and 26th August at the Loskopdam Aventura Resort.

The Theme will be "Pharmacists for quality care" and some topics are:

- Annual Report from VHL
- Assistant Training
- Effective Prescribing
- Expenditure/budget
- Integrating research into pharmacy planning
- Communicable diseases
- Drug Supply Management
- Presentations by: SAAHIP, MEDUNSA etc.

TRAINING AT EKANDUSTRIA

A function was held at the VHL Ekandustria Depot on Friday May the 12th, where the successful candidates in the preliminary in-service training for Pharmacist Support Personnel received their certificates.

We would like to thank Mr. Mathews for all his hard work, and congratulate the students on their success.

The students that obtained a pass mark, have now started with their second year of training, while the others are working hard to gain enough knowledge to meet the requirements of each unit standard.

Sandra v. Rensburg, Ekandustria

MEET THE WAREHOUSE MANAGER

Willem Johannes Jacobus van Rooyen, alias Joël, was born on the 7th October 1957 in Johannesburg, and grew up in the small North West town of Zeerust.

Following his matriculation at Zeerust High School, he became a member of the S.A. Police Force in 1976, and resigns in 1983 to establish a career in the private sector, and after working for two companies, he joins up with the Lennon Petersen Agency, a S.A.D. company, as Security Manager in charge of eleven principles.

In the course of 1990 he is transferred to Pietersburg to act as Depot Manager for L.P.A., supplying stock under contract to the former Gazankulu and Venda states. During 1994 Lennon Petersen stops trading, and Stratmed is born - taking over the responsibility, with Joël appointed as Operational Manager in charge of the Depot.

In November 1995 Stratmed got the distribution contract for the Northern Province, and when Thebe took over, the name changed to Vuna Healthcare Logistics.

During November 1997 Joël reaches an enormous goal when he is transferred to the Mpumalanga Pharmaceutical Depot to act out his role as Depot Manager, a post in which he is still active.

At present he is staying in Middelburg, Mpumalanga, with his lovely wife, Judy, and two children, Albert and Hester.

WHAT'S HAPPENING IN MIDDELBURG

LETTER TO THE EDITOR

With this letter I wish to thank VHL for allowing us the opportunity to undergo the preliminary training program. Also a word of thanks to Mr. Mathews and Miranda for all their time and effort with the In-service training course as well as the Literacy course.

I also want to thank the management at Middelburg for allowing us time in the morning to open with a prayer.

Words of Wisdom: Matthew 5:15, 16

"Neither do people light a lamp and put it under a bowl. Instead they put it on its stand, and it gives light to everyone in the house. In the same way, let your light shine before men, that they may see your good deeds and praise your Father in heaven"

Elizabeth Sithole

TRAINING

Training at the Middelburg Pre-pack Unit is continuing, with 7 First Year students under the capable Tutorship of Vanessa Haarhoff, and 5 Second Year students who received their certificates at the VHL Ekandustria Depot function on the 12th of May. At present this group is busy with the Module on Packaging and Pre-packing, and on Thursday the 20th June the 6 Second Year students from the Ekandustria Depot visited us to obtain some practical experience on the pre-packing process.

STOCK

The new Pre-pack List, that will include items on the PHC list as well as items indicated by the hospitals, is in the process of being finalised. This new list will be distributed to all the outlets as soon as possible.

As you might be aware, we have been experiencing some difficulty with supplies from Quatromed, and items that are on the essential list have been affected. We hope to have the problem resolved soon.

STAFF MATTERS:

Our 4th Vuna Middelburg baby was born in May - congratulations to Linah Skhosana and her family.

We also have 2 new staff members - Welcome to Stephen Marutla from NPPD and Thomas Mabunda from the Ekandustria Depot - we hope that they will enjoy working with us here in Middelburg.

Lynette Minnie

LETTER TO BERTIE BOTHA VHL MANAGER NPPD

The large majority of the population of Seshego participated during the VUNA and Vukani Cleaning Campaign on the 21st April 2000.

Youth of the following zones were seen picking up papers and partaking actively i.e. Zones 1, 2, 3, 4, 5, 6, 8, Lethuli and the VHL zone.

After the cleaning everybody gathered at zone 3 park for the Easter picnic and the award ceremony sponsored by Vuna Healthcare Logistics. The first 10 participants each received R50 while the last participants received R20 each.

The aim of the whole operation was to create Seshego as a clean and winning nation, and representatives from the department of Health and Seshego Hospital attended.

A donation of R450 from VUNA was presented to Vukani after the event, to buy office stationery.

S.Moseri - Chief Executive Officer: Vukani Youth Forum



Misheck of VHL, handing out prizes for the cleaning campaign.

History of the Northern Province Depot

In June 1994 Stratmed opened its warehouse in Ladanna, supplying the former Gazankulu and Venda hospitals. The warehouse was run by one pharmacist, two administration clerks and ten warehouse personnel.

NPPD was opened in December 1995. The former TPA, Lebowa and Stratmed (Gaz & Venda) medical stores were closed, and the stock was amalgamated into one warehouse at Seshego.

All hospitals in the Northern Province were supplied by this Depot from February 1996, and at that stage the warehouse was managed by two pharmacists, with four admin. clerks, twenty Provincial enrolled staff and ten of the former Stratmed staff.

As time went by, more staff were employed and trained, the team now consisting of:

3 Pharmacists	3 Training personnel	20 Warehouse personnel
15 Admin personnel	4 IT personnel	8 Delivery personnel

Of the total of 53 personnel, 13 members are enrolled staff.

Bertie Botha

NORTHERN PROVINCE CONFERENCE:

The yearly Pharmaceutical Conference of the Province was held on the 14th to the 16th of April at Klein Kariba near Warmbaths. The venue was superb and naturally beautiful, making the atmosphere very relaxing, with excellent accommodation.

The arrangements were made in time, and no housekeeping problems were encountered, the organisers always available to assist, with VHL and Pharmacare as the main sponsors.

Many items were presented and discussed, some of which were:

Promoting Rational Drug Use

Hormone Replacement - Dr. O. Shimange

ACE Inhibitors - Dr. Snyman

Hospitals on Research problems - the winning presentation by K.Mlati of

Seshego Hospital on "The misuse of Diclofenac Injections"

The "Out of Africa Dinner" was glamorous, and the standard of the conferences keep on improving every year, with this one the best so far.

Ntsakisi Phakula & Khanyi Mlati

MEET THE TEAM

Keith McCullough
the CEO of VHL

Keith has been involved with the company since 1988. He was one of the founders, and has persevered in building the company to what it is today. He is definitely an outdoors person - and enjoys bird watching, wildlife, photography, travelling to exotic places, playing golf and jogging. He is keen on reading and loves cats.

Bada Pharasi
the MD and Deputy CEO

Bada has been with VHL since January 1999, and believes that VHL can make a positive contribution towards the implementation of the National Drug Policy. He enjoys watching sport - especially soccer, cricket and boxing. He goes to the gym regularly, and derives joy from buying books.

Renier Botha
the Programs Manager
H & C Systems.

Renier is responsible for all H & C projects, preliminary training of pharmacist assistants and literacy training. He is also responsible for the establishment and implementation of the VHL-Datacare Section, and is involved in new business development. Renier has been with VHL for more than 5 years, and his present interest is his work (which is also his hobby).

Compiled by Lynne Ras

NEWS FROM THE PHARMACY COUNCIL: OBITUARY:

LEON CHRISTODOULOU
13/11/54 - 29/7/00

It was with shock that we heard of the death of Leon, and the Editorial Staff of VUNA VISION would like to extend their condolences to his family, relatives, colleagues and friends.

Leon was the Manager of Pharmacy Education at the South African Pharmacy Council, and was actively involved in continuing education programmes for Pharmacists and Pharmacist Interns, the development of the Unit Standards for Basic Level and Post-basic Level Pharmacist Assistants, and Entry Level Pharmacists, as well as curriculum design and development for pharmacy education at pharmacy schools from the unit standards.

He was actively involved in, and represented Pharmacy at various Councils, National Bodies, and Committees, and was awarded the 'Pharmacist of the Year Award' in 1995.

For those of us who had the opportunity and privilege to have known him, we will always remember him for his dedication, and enthusiasm for his work.

NEW FROM THE NORTH WEST PROVINCE

Stellenbosch University <http://scholar.sun.ac.za>

VHL North-West was established and the Mmabatho Medical Store operation was taken over to be managed by VHL as from 1 October 1999. Prior to this date, a lot of preparation and planning was done for the upgrading of the facilities, particularly to improve security, workflow and utilisation of available space.

As with any operation with a number of new staff and a new system, a lot of teething problems were encountered. Initially only 18 of the 24 hospitals were supplied, with the remainder to be accommodated by April 2000.

The size of the facility is 6000 square meters, with 49 personnel members employed under VHL management. Three are also employed by the Department of Health and are responsible mainly for accounting, tender administration and motivational item approval.

Training programmes are in place – one for the introduction of the PDSX stock management system in all hospitals to be supplied by MMS – this project is managed by Renier Botha, with two pharmacists employed to ensure that the implementation process stays on track and time schedules are met.

An in-service training program was also introduced in June to prepare the Support Staff for the planned Pharmacy Council course for Pharmacist Assistants, and will give the students a broader understanding of the warehouse operations, procedures and regulations.

Some problems currently experienced are:

1. Availability of certain stock items mainly due to poor supplier performance.
2. Shortcomings in the Provincial Code List – mainly on the surgical side
3. The slow process involved in obtaining Motivation Items & effective feedback
4. Erratic order patterns by some institutions, affecting availability to others.

A lot of hard work was put into the operation so far, with commitment of the people at the warehouse to succeed in the goals set, and I want to extend a word of thanks to all personnel at the Mmabatho Medical Store for their commitment and hard work over the last few months. Change in itself is difficult to overcome, because it takes you into the unknown - you have done well so far!

Dirk van Wyk

EDITORIAL PANEL

Editor: Almero Mathews
Tel/Fax (014) 717 2749
Cell 083 454 9222
e-mail: almerom@iafrica.com

VHL Sub-Editors:

N.P Bertie Botha
Tel (015) 233 5724
Fax (015) 223 0690

M.P Sandra v. Rensburg
Tel (013) 933 3275
Fax (013) 933 3615

N.W Dirk v. Wyk
Tel (018) 384 2978
Fax (018) 384 3165

Johannesburg Office

Sydney Khumalo
Tel (011) 608 0903
Fax (011) 608 0933

Provincial Sub-Editor:

Emily Rasengane (N.P)
Tel/Fax (015) 223 0324

Layout & Design:

Robyn Hurwitz
Tel/Fax (011) 880 1008
Cell 082 444 8761

All letters for publication must please be signed, with full name, telephone number and address. No letters that are slanderous or political will be published. Letters can be posted to The Editor, Vuna Vision, P.O. Box 388, Nylstroom, 0510, or any of the sub-editors via the Distribution Depots.

NB:

Due to limited space, some articles might regrettably be edited or shortened, while trying to retain the essence of the contents.

Editor:



From the Editors Desk

Did you know?

The highest recorded total of pills swallowed by a patient is 414,134 between June 1967 to January 1983 by C.Kilner of Bindura, Zimbabwe, following a successful operation to remove a cancerous pancreas in May 1966. (An average of 72 pills per day - Ed.)

Guinness Book of Records 1985.

Treating asthma with Ephedrine – a drug derived from the horse-tail plant, has been known in the West since the 1920's, but Chinese doctors were using the drug nearly 1700 years earlier. Its use was advocated by a doctor called Zhang Zhongjing as early as the 2nd century AD.

Readers Digest Book of Facts.

Don't Quit

When things go wrong
as they sometimes will

When the road you are
trudging seems all uphill

When funds are low
and the debts are high

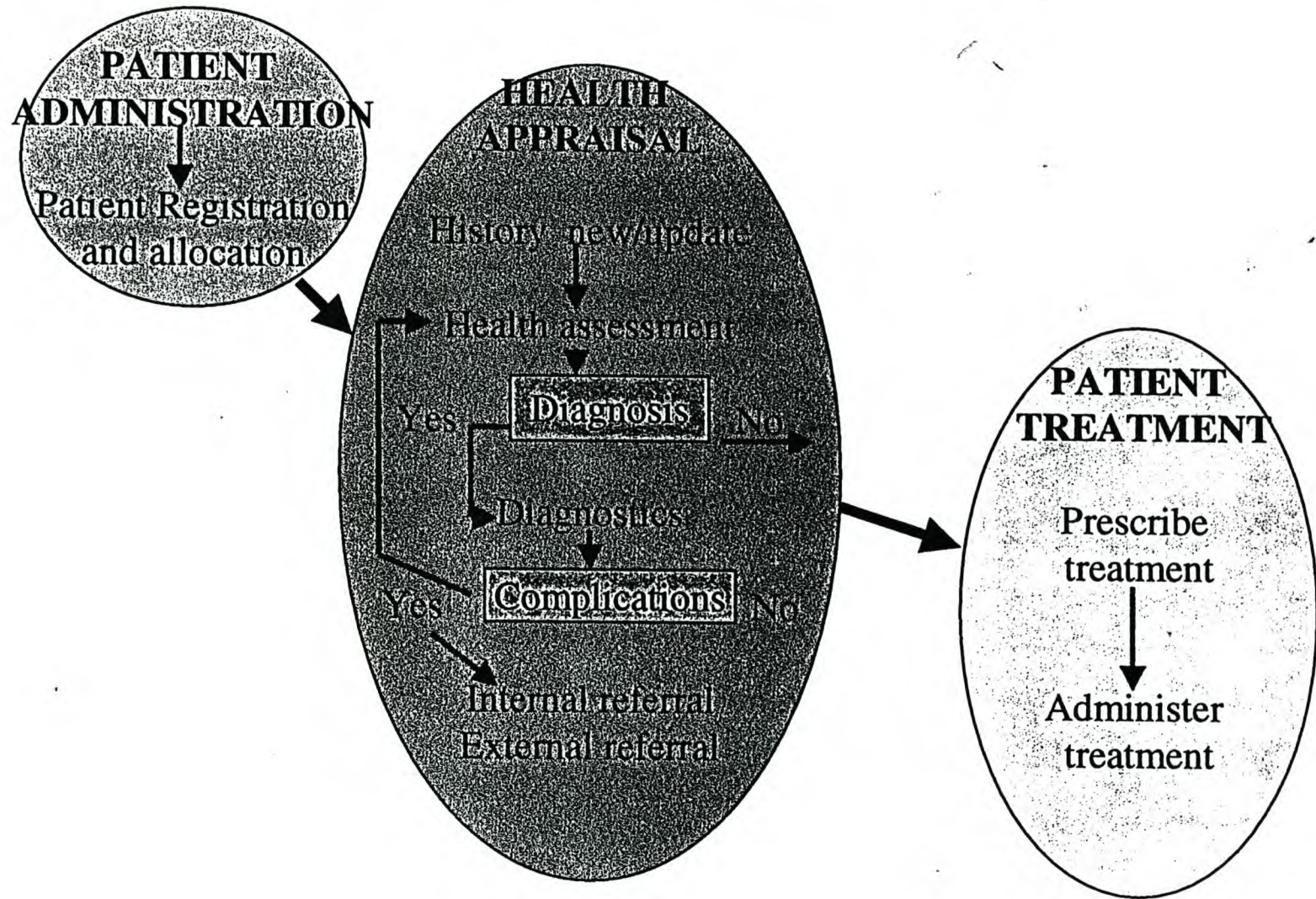
And you want to smile,
but you have to sigh

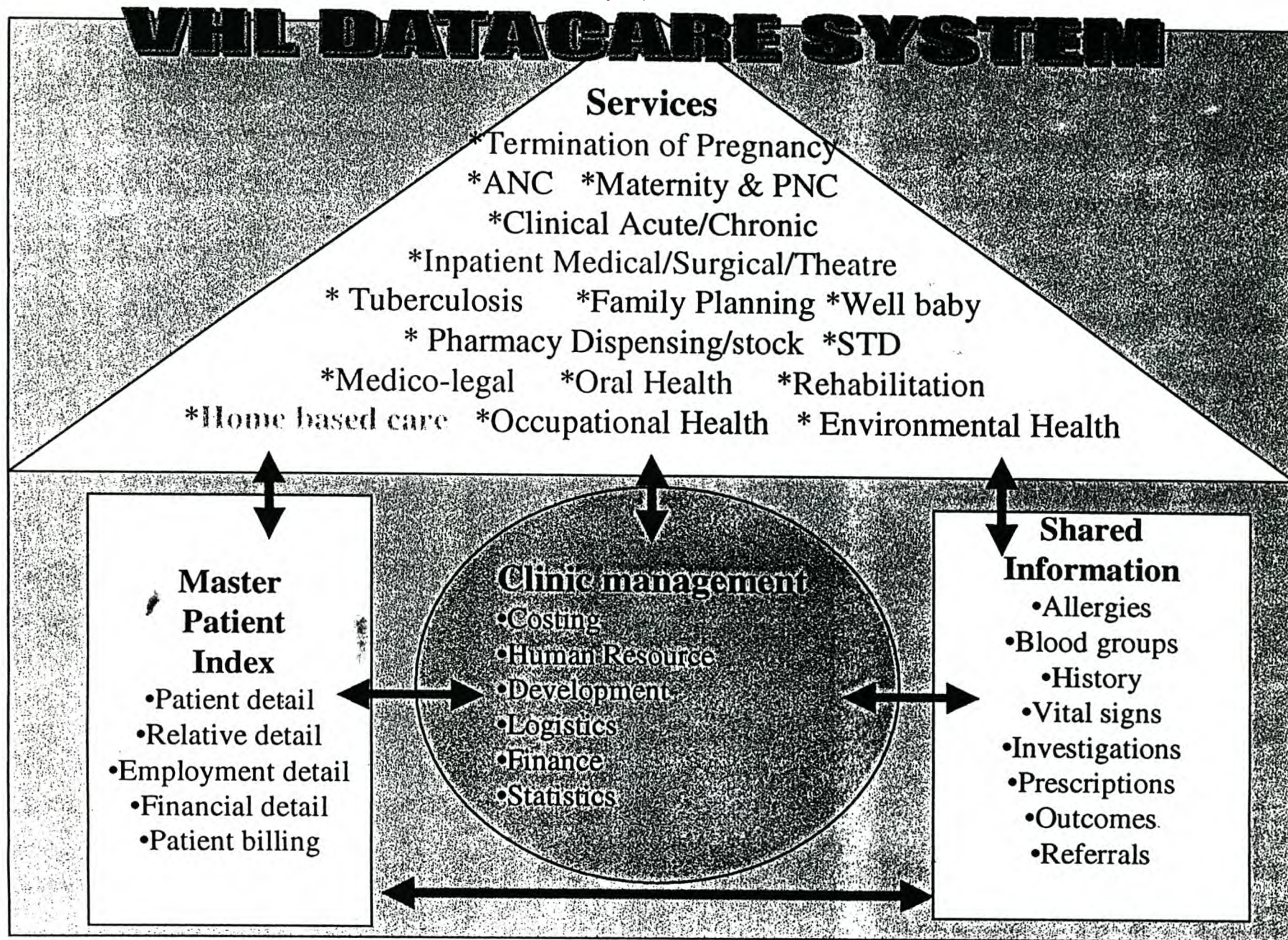
When care is pressing you
down a bit

Rest if you must,
but just don't quit

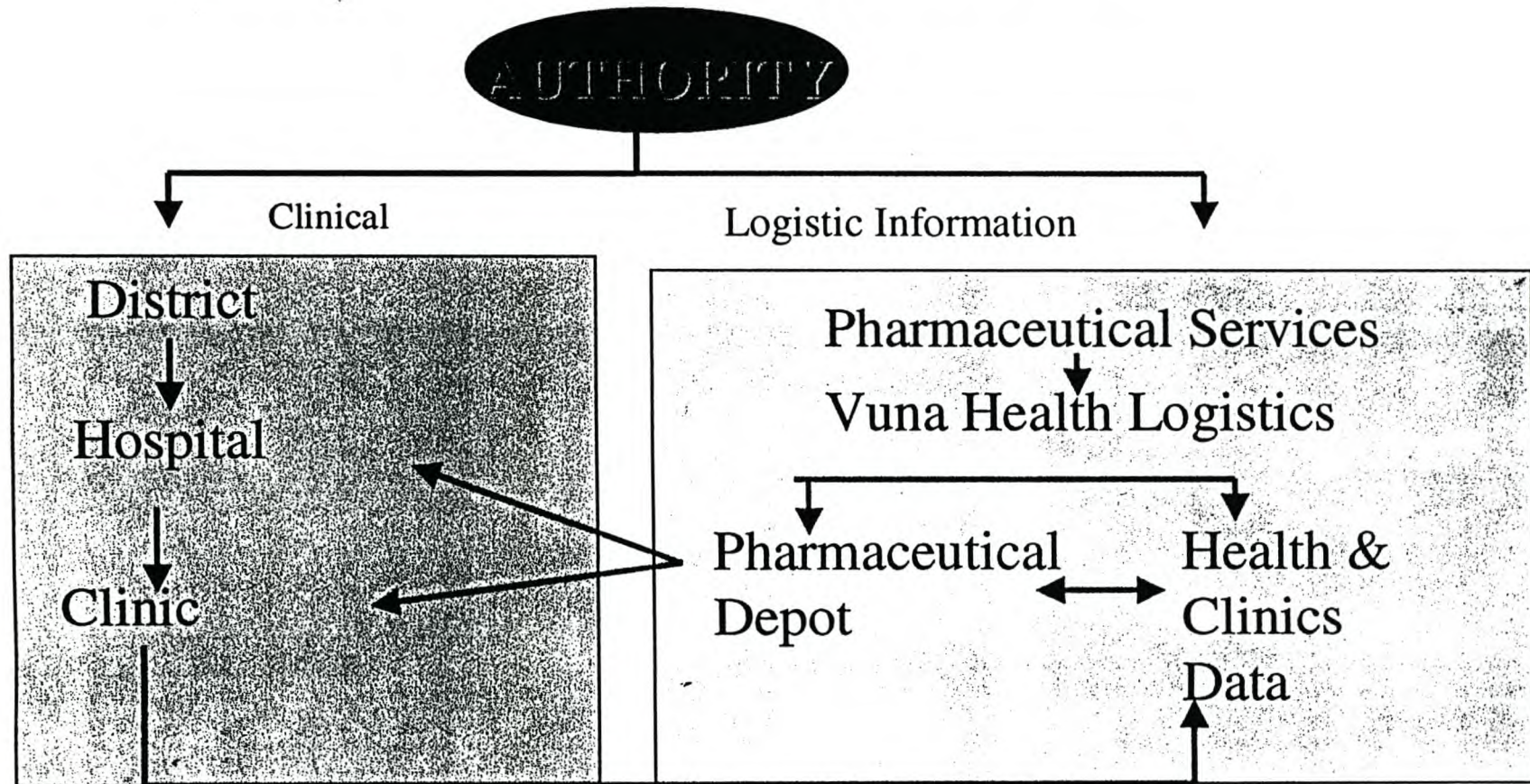
Anon

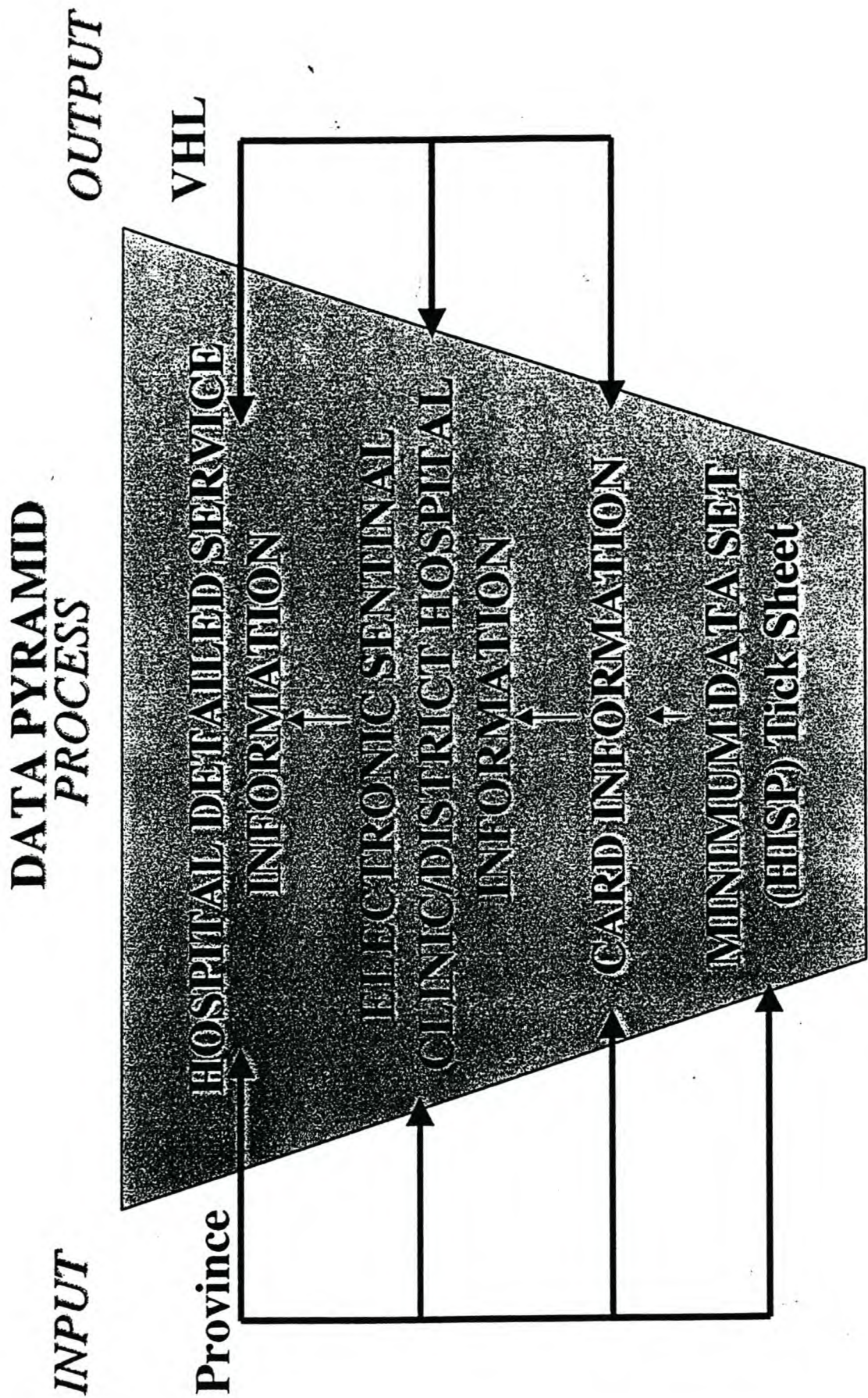
BUSINESS PROCESS





CLINICAL AND LOGISTIC INFORMATION FLOW





Information services (Standard Package)

Service Description & Cost	Service Items & Quantification	Benefits and Justification
<p>Standard 80% of patients will be processed through the "Lotto" type patient data collection card. The remaining 20% of patients will be processed through the detailed electronic clinic management system strategically place as sentinel sites.</p> <p>By utilizing the "Lotto" type patient data collection card you will collect the basic indicator data and operational information on a specific services such as pharmacy, TB etc. You will be provided with a software tool to electronically process all transactions.</p> <p>The full electronic system will provide you with a software tool to process all patient contacts and collect very detailed data. You will be able to draw the very detailed reports from the data.</p> <p>Cost: _____</p> <p>A sliding scale for costing will apply</p>	<ul style="list-style-type: none"> • Software Right of use of clinic • Software Maintenance • Documentation <ul style="list-style-type: none"> ◦ Software Manuals (One Set) ◦ Release Notes (One Set) • Training <ul style="list-style-type: none"> ◦ Clinic and Management staff on software systems (1 Staff/ _____, min of one staff per contract) ◦ New releases (one session per contract) ◦ Clinic and management staff on operating systems (1 Staff/ _____, min of one staff per contract) • Help desk <ul style="list-style-type: none"> ◦ Remote software support ◦ Assistance with software set-up ◦ General advise • Operations re-engineering <ul style="list-style-type: none"> ◦ Systems analysis ◦ SOP writing, consultation and facilitation • Implementation facilitation <ul style="list-style-type: none"> ◦ General re-organization ◦ General software set-up ◦ Maintenance of default setups • Stock file maintenance <ul style="list-style-type: none"> ◦ Price updates (monthly) ◦ Registration of new items (as required) • Management information Service <ul style="list-style-type: none"> ◦ Ongoing monitoring of data ◦ Monthly management reports ◦ Ad hoc reports • Annual operations audit 	<ul style="list-style-type: none"> • Your operations will be monitored by us and you will received monthly and on request management reports. • Your operations will be evaluated annually by a knowledgeable and experienced team to measure progress made • Support of a knowledgeable and experienced team in re-engineering of your operating systems • Support of a knowledgeable and experienced team in implementing your operating systems • A daily maintained stock item price file • Use of a well tested and user friendly software tools • Training on how to use that tool and the operating systems • Access to a help desk to support the users of the tool <ul style="list-style-type: none"> • A detailed situation and needs analysis will be performed that will assist you in planning your service • Assistance in designing of pharmacy facilities • Motivational programs such as the pharmacy of the year etc. • Support of social responsibility programs Use of a well tested and user friendly software tool • Training on how to use that tool • Access to a help desk to support the users of the tool • Very detailed information will be obtained in the sentinel sites • Through internal validation processes you will obtain a very high quality data. • Operational information on critical and costly programs such as TB en pharmacy will improve clinical outcomes and produce savings that should pay for the intervention • All data can be merged in to one master database that will provide a base of information if a full electronic system should be implemented later.

Gold Package (Additional services)

Service Description & Cost	Service Items & Quantification	Benefit & Quantified Value
<p>This package will provide you with additional resources and skills that normally negatively impacts on your ability to provide the service.</p> <p>Cost: This will be costed individually based on a situation and needs analysis with you</p>	<ul style="list-style-type: none"> • Hardware procurement and maintenance • Procurement and distribution of consumables <ul style="list-style-type: none"> ◦ Patient data cards ◦ Ribbons ◦ Labels ◦ Invoice and paper • Full Information system management 	<ul style="list-style-type: none"> • You will have access to mission critical resources that usually are problematic to obtain. • The contracting out of the information management will give you access to our skill and knowledge in operating such systems. <ul style="list-style-type: none"> ◦ More cost effective use of your resources ◦ Less problems for you in providing you services

Pharmacy Services (Standard Package)

Service Description & Cost	Service Items & Quantification	Benefit and other value
<p>This package will allow the client to re-engineer and computerize its stock control and dispensing in the pharmacy. It will also provide a regularly updated item price file, training of supply point staff, management information production service and an annual operations audit.</p> <p>Cost: 2.4% on net value of Issues (based on a minimum issue value of R26 million)</p> <p>A sliding scale for costing will apply</p>	<ul style="list-style-type: none"> • Software Right of use of Stock control and dispensing software • Software Maintenance • Documentation <ul style="list-style-type: none"> ◦ Software Manuals (One Set) ◦ Release Notes (One Set) ◦ Pharmacy Standard Operating Procedures Manual (3 copies per contract) ◦ Clinic Standard Operating Procedures Manual (1 copy per R0, 5mil of nett issue value) • Training <ul style="list-style-type: none"> ◦ Pharmacy staff on stock system (1 Staff/ R1.5mil net issues, min of one staff per contract) ◦ Pharmacy staff on dispensing system (1 Staff/ R2mil net issues, min of one staff per contract) ◦ New releases (one session per contract) ◦ Pharmacy staff on Pharmacy operations system (1 Staff/ R1mil net issues, min of one staff per contract) ◦ Outlets (Clinics, wards etc.) staff on Pharmacy operations system (1 Staff/ R0.5mil of net issues, min of one staff per contract) • Help desk <ul style="list-style-type: none"> ◦ Remote software support ◦ Assistance with software set-up ◦ General advise • Operations re-engineering <ul style="list-style-type: none"> ◦ Systems analysis ◦ SOP writing, consultation and facilitation • Implementation facilitation <ul style="list-style-type: none"> ◦ General pharmacy re-organization ◦ General software set-up ◦ Stock file • Stock file maintenance <ul style="list-style-type: none"> ◦ Price updates (monthly) ◦ Registration of new items (as required) • Management information Service <ul style="list-style-type: none"> ◦ Ongoing monitoring of data ◦ Monthly management reports ◦ Ad hock reports • Annual operations audit 	<ul style="list-style-type: none"> • Your operations will be monitored by you and us will received monthly and on request management reports. • Your operations will be evaluated annually by a knowledgeable and experienced team to measure progress made • You clients will be trained on how to interact with you • Support of a knowledgeable and experienced team in re-engineering of your operating systems • Support of a knowledgeable and experienced team in implementing your operating systems • A daily maintained stock item price file • Use of a well tested and user friendly software tool for stock control and dispensing • Training on how to use that tool and the operating systems • Access to a help desk to support the users of the tool • A detailed situation and needs analysis will be performed that will assist you in planning your service • Assistance in designing of pharmacy facilities • Motivational programs such as the pharmacy of the year etc. • Support of social responsibility programs

Gold Package (Additional services)

Service Description & Cost	Service Items & Quantification	Benefits and Advantages
<p>Gold</p> <p>This package will provide you with additional resources and skills that normally negatively impacts on your ability to provide the service.</p> <p>Cost: This will be costed individually based on a situation and needs analysis with you</p>	<ul style="list-style-type: none"> • Hardware procurement and maintenance • Procurement and distribution of consumables <ul style="list-style-type: none"> ○ Patient data cards ○ Ribbons ○ Labels ○ Invoice and paper • Full pharmacy logistics management 	<ul style="list-style-type: none"> • You will have access to mission critical resources that usually are problematic to obtain. • The contracting out of the logistics management of the pharmacy will give you access to our skill and knowledge in operating such systems. <ul style="list-style-type: none"> ○ Under specific conditions we would also take on the responsibility for the stock in the systems thereby reducing your risk of misuse abuse and theft of stock ○ Normally one would see a reduction of stock value in the system ○ More cost effective use of your resources

CLINICAL INDICATORS

Page 1

Month : 03/1999

Location : WC

Staff Services**Headcount Workload**

Nursing and doctor headcount: 36.00

Consultation + Procedures Workload

Expected hours: 25.00

Actual hours:

Hospital referral ratio: 4.50

Internal referral ratio: 5.60

Maternal & Child Health Services

EPI drop out ratio: 137.50

Teenage pregnancy ratio: 14.00

Teenage delivery ratio: 45.00

Early booking ratio: 60.00

Average ANC visits: 26.00

Delivery referral ratio: 25.00

Low birth weight ratio: 6.50

Disease Surveillance

Positive Pap ratio: 87.50

Severe malnutrition ratio: 4.57

Newly diagnosed Mental illness: 14.16

PHARMACEUTICAL INDICATORS 1

Page 1

Month : 03/1999

Location	Ave Drugs per Encounter	% Encounters Antibiotics presc.	% Encounters Injections presc.	% Drugs from EDL	% Patients treated without Drugs	Ave Drug Cost	% of Cost Antibiotics	% of Cost Injections
KP	2.50	18.30	15.40	73.20	28.20	8.95	43.00	32.00
RL	2.50	25.00	15.00	67.00	24.60	15.34	34.00	23.00
WC	3.10	34.00	14.00	83.00	32.00	8.40	39.00	26.00
Average	2.70	25.77	14.80	74.40	28.27	10.90	38.67	27.00

PHARMACEUTICAL INDICATORS 2

Page 1

Month : 03/1999

Location	No Prescription	Line Items Prescribed	Prescribed Line Items Issed	Replacement Line Items Issed	Line Items Not Available	% Compliance	% Available
KP	1,540	6,523	5,823	345	643	68.00	78.00
RL	2,523	9,345	7,854	587	1,245	68.00	75.00
WC	980	2,940	2,432	350	240	65.43	73.25
Total	5,043	18,808	16,109	1,282	2,128	Ave 67.14	75.42

FROM:	C	0	1	2	3	4	5	6	7	8	9
A		1	2	3	4	5	6	7	8	9	
CARD NO	0	1	2	3	4	5	6	7	8	9	
	0	1	2	3	4	5	6	7	8	9	
1000	2000	0	1	2	3	4	5	6	7	8	9

DATE		.00	.01	.02	SUN	MON	TUE	WED	THU	FRI	SAT
JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	2	3	4	5	6	7	8	9	10	20	30
Type		Waste	Break	SSIC	Return	Adjust					
		Count									
Qty		0	10	20	30	40	50	60	70	80	90
		+	-	0	1	2	3	4	5	6	7
		100	200	300	400	500	600		100	200	300
Drug		0	10	20	30	40	50	60	70	80	90
1000		0	1	2	3	4	5	6	7	8	9
TO:	C	0	1	2	3	4	5	6	7	8	9
A	B	0	1	2	3	4	5	6	7	8	9
Responsible		0	1	2	3	4	5	6	7	8	9
		0	1	2	3	4	5	6	7	8	9
1000	2000	0	1	2	3	4	5	6	7	8	9

Drug	
------	--

Qty					
-----	--	--	--	--	--

Resp		Sign	
------	--	------	--

DATE		.00	.01	.02	SUN	MON	TUE	WED	THU	FRI	SAT
JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	2	3	4	5	6	7	8	9	10	20	30
Type		Waste	Break	SSIC	Return	Adjust					
		Count									
Qty		0	10	20	30	40	50	60	70	80	90
		+	-	0	1	2	3	4	5	6	7
		100	200	300	400	500	600		100	200	300
Drug		0	10	20	30	40	50	60	70	80	90
1000		0	1	2	3	4	5	6	7	8	9
TO:	C	0	1	2	3	4	5	6	7	8	9
A	B	0	1	2	3	4	5	6	7	8	9
Responsible		0	1	2	3	4	5	6	7	8	9
		0	1	2	3	4	5	6	7	8	9
1000	2000	0	1	2	3	4	5	6	7	8	9

Drug	
------	--

Qty					
-----	--	--	--	--	--

Resp		Sign	
------	--	------	--

VISIT DATE	.00	.01	.02	SUN	MON	TUE	WED	THU	FRI	SAT	
JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DE
1	2	3	4	5	6	7	8	9	10	20	31
CLINIC	C	0	1	2	3	4	5	6	7	8	9
A	B	0	1	2	3	4	5	6	7	8	9
ATTENDER	0	1	2	3	4	5	6	7	8	9	9
1000	2000	0	1	2	3	4	5	6	7	8	9
CLIENT	C	0	1	2	3	4	5	6	7	8	9
A	B	0	1	2	3	4	5	6	7	8	9
M	F	0	1	2	3	4	5	6	7	8	9
W	C	0	1	2	3	4	5	6	7	8	9
I	B	0	1	2	3	4	5	6	7	8	9
IN	ID	0	1	2	3	4	5	6	7	8	9
IM	IP	0	1	2	3	4	5	6	7	8	9
ISA	OSA	0	1	2	3	4	5	6	7	8	9
CHILD HEALTH		1st	He			W1	W2	W3	W6	W7	
TYPE	His	Exa	Gro		Dev	AP1	G	F	S	H	
IMMUNISATION		RUB			MMR		DT	1	2	3	4
BCG	Birth				Other		DPT1B	1	2	3	Other
Polio	Birth	1	2	3	Other		Measles	1	2		Other
HepB		1	2	3	Other		Heac			PriComp	
TT		1	2	3			X1	X2	X3	X4	X5
FAMILY PLANNING		1st	He				IUCD	Fit	Chk	Ren	
TYPE	His	Exa	Cons		Uocdy		Stem			P1	P2
Triphasil			Nordette				Microval			Ovral	
Marvalon					Depo Provera		Nur-lsterate			PCC	
Qty	1	2	3	4	5	6	Condoms	10	20	30	
Prescriber /	0	1	2	3	4	5	6	7	8	9	
Clinician	0	1	2	3	4	5	6	7	8	9	
1000	2000	0	1	2	3	4	5	6	7	8	9
Qty	2	3	4	5	6	Drug1	100	200	300	400	500
O/S	Alt	0	10	20	30	40	50	60	70	80	90
1000	2000	0	1	2	3	4	5	6	7	8	9
Tests	Pap	Hiv	WR	Rh	HB	Sputum	Urine	Other			
Nutrition	Veget	EWV	BF	Sor	97+	+G1	G1	G2	G3	Kwa	Heig
ANTE/POST NATAL	A	P	1st	He	Exa	<20	<28	<36	>36		
						Top Done	Top	Top Advice	ADV		
MATERNAL	Delivery	BBA	Unbook	Stl	Mut		Refer	Labour	Baby	Move	
	His	Admi	Cons		Type	Norm	Vac	Fore	2.5hr	ML	
GERIATRIC	Foot		Med	Mental Health	TB	Susp	Cont	Diag	DOT		
	Script	Chr	Ach	Act	New	Chron	Sputum	Pie	2Mth	6Mth	Other
REFERRAL	Oral	Clinic	CHL	Soc	PHL	Emf	Uocdy	Hosp	MH	Reha	
PROF SERV	Nurse	Coun	Reha	Dres	Socia	PHC	Uocdy	Poc		UNV	
TB REGISTER				TRANSFER/MOVE	N	M	T				
CAT	N	TC	TAC	RF	RI		REGIME		1	2	3
ICD10	16.2	16.3	16.5	16.7	17	18	18.8	19.9			
Smear		P	2	3	6	7	Result		P	N	
Culture		P	2	6	6	7	Result		P	N	
Turnaround time		1	2	3	4	5	TAT				
Sens	R	S	Drug	SAD	INH		PZA	EMB	STM	RIF	OTH
Diach	NC	RC	Outcome		C	TC	TF	D	I	TRAN	MVD
Refer to Hosp		Y		X-Rays		1S	2S	1L	2L		
D	E	Z0	Z1	Z2	Z3	Z4	Z5	Z6	Z7	Z8	Z9

Appendix D: Extracts from Paarl Municipality IDP

DRAFT



1997-1998

INDEX

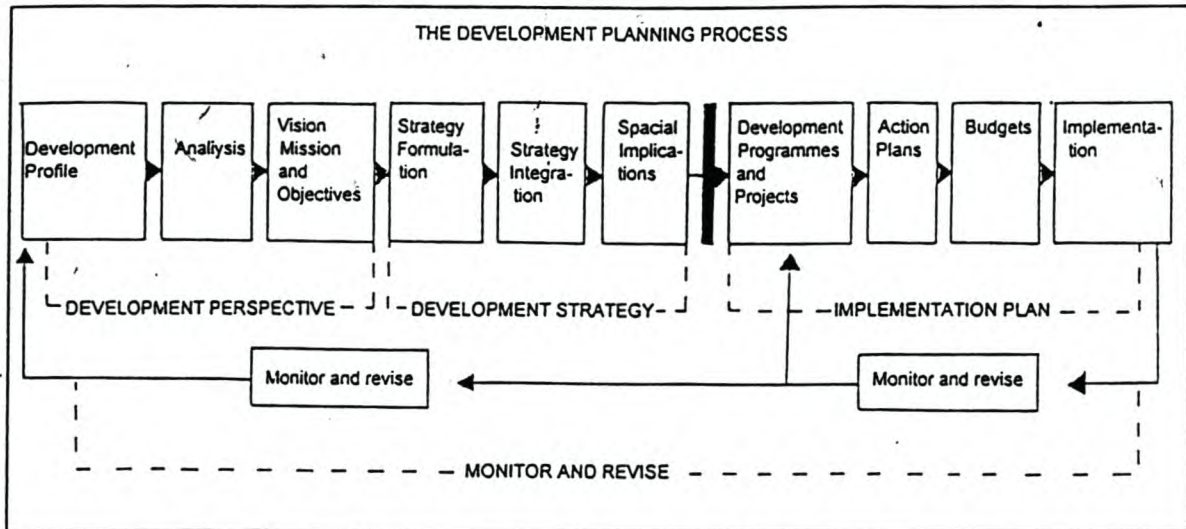
PREAMBLE

CHAPTER 1 : DEVELOPMENT PROFILE OF PAARL MUNICIPAL AREA.

	Page
1.1 Introduction	1
1.2 Essential Services	2
1.2.1 Education	2
1.2.2 Libraries	3
1.2.3 Municipal Infrastructure	4
1.2.4 Post Office	6
1.2.5 Telephone Services	7
1.2.6 Safety and Security	7
1.2.6.1 Fire Brigade	7
1.2.6.2 Police	8
1.2.6.3 Prisons	9
1.2.6.4 Magistrate's Court	9
1.2.6.5 Traffic Control	9
1.3 Community Services	9
1.3.1 Churches	9
1.3.2 Sport and Recreation	10
1.3.3 Transport	11
1.3.4 Tourism	11
1.4 Social Demography	13
1.4.1 Population Profile	13
1.4.2 Health Care Facilities	13
1.4.3 Welfare	14
1.5 Socio-Economic Profile	14
1.5.1 Institutional Capacity	14
1.5.2 Employment and Education	16
1.5.3 Economic Structure	17

PREAMBLE

The Department Planning and Development in the Municipality of Paarl was tasked to compile an Integrated Development Framework for Paarl. The process which we endeavoured to follow, is illustrated below:



This document aims to analyse the existing developed environment in order to form a basis for the formulation of a vision, mission and development objectives for Paarl. The document will be made available to the public and interest groups such as the RDP Forum for comment and input.

CHAPTER 1:

DEVELOPMENT PROFILE OF PAARL MUNICIPAL AREA.

1.1 Introduction.

Paarl was named after the smooth granite rocks on Paarl Mountain. The first allocation of agricultural land in Paarl Valley were made in 1687. (1) In 1840 the Municipality of Paarl was constituted. The subdivision of land for the establishment of a town only followed after the opening of the railway station in 1863. (2) Today Paarl comprises approximately 6700 hectares of land. Of this 3805 ha comprises the town and 2895 ha comprises the mountain reserve.

From an original agricultural settlement, Paarl has grown into an important economic centre in the Boland. Industry and commerce, together with agriculture, are the main contributors to the local and subregional economies. The main agricultural activity is viniculture, and many industries serving this agricultural sector have thus been established in Paarl.

Paarl is bordered by Paarl Mountain to the west, the Drakenstein Mountains to

the east, the N1 National Road to the south and Wellington to the north. The Valley is traversed by the Berg River and its tributaries.

The oldest rocks in the valley are of the pre-Cambrian age (3). Alluvial and sandstone deposits are found in the lower parts of the valley. The sandstone deposits have been carried down from the surrounding mountains to the low-lying parts. Rock formations in the vicinity of Paarl consist mainly of the Malmesbury Group, with granite intrusions that form Paarl Mountain (4).

Paarl is situated in the Winter Rainfall Region and receives a good average rainfall of 954mm per annum. Winter temperatures are mild and vary between 7°C and 8°C. Summers are hot with an average temperature of 31°C. (5). A moderate south-easterly wind in spring and summer neutralises the severe heat in the valley. (6).

- (1) In the Valley of the Berg : Or the romance of a South African town.
Ed : Maré, B.J. and Sands G.W. 1924 Paarl : Paarl Printing Company (p.15)
- (2) Cape Metropolitan Area Guide Plan.
Volume 4 : Paarl/Wellington, 1991. Cape Town: Department of Planning, Provincial Affairs and National Housing (p. 30).
- (3) Impey, L.L.H. A Regional Survey of the Upper Berg River Valley. 1958.
University of Cape Town : M.A. (Geography) Thesis.
- (4) See (2) above (p.30).
- (5) Paarl Valley 1687 - 1987 . Ed by Oberholster, A.G. 1987. Pretoria : Raad vir Geesteswetenskaplike Navorsing. (pp. 6 - 7).
- (6) See (2) above (p.30).

1.2 Essential Services.

1.2.1 Education.

Paarl offers the following education facilities:

TABLE : EDUCATION FACILITIES

TYPE	NUMBER	STUDENTS
Creche	34	2277
Primary School	22	17789
Secondary School	11	9568
Tertiary	3	3640
TOTALS	70	33274

The current estimated total population figure for Paarl is 120 000, indicating that between 25% and 28% (excluding students who live in Paarl hostels but have a permanent address elsewhere) of the population falls in this category.

The number of primary school students is 17 780 distributed over 7 years (Grade 1 to 7). This gives an average number of 2541 students per grade. The number of secondary school students is 9568, distributed over 5 years (standards 6 - 10), indicating a average of 1914 students per grade.

The above figures indicate an increase of 32% in number of students per grade. However, the provision of schools is a function of the Department of Education and the need for additional schools will be assessed by them.

1.2.2 Libraries.

There are three libraries with a total membership of 25 108 which comprises approximately 25% of the population of Paarl.

Services offered include:

- lending of material
- reference services and research
- "childrens: library
- library services to old age homes
- storey telling hours
- library week and holiday programmes
- exhibitions
- induction courses

The Chief Librarian emphasises the need for a new library.

R1,9 million is provided in the 97/98 budget and R1,675 million in the 98/99 budget for provision of an additional library in Paarl East. The project should be completed in 1999.

The following amounts were budgeted for a multi-purpose community centre in Paarl East subject to fund availability:

97/98	R1,428 million
98/99	R1,642 million
99/2000	R1,888 million

This renders a total of R4,948 million. The project could be completed in 2000.

R1,428 million was budgeted for a multi-purpose community centre in Mbekweni subject to fund availability. The project could be completed in 1998.

*Mbekweni
subject to
fund availability*

Paarl with an estimated population of 120 000 need at least a library of 2000m². Currently the size of the three libraries together amounts less than 1000m². (Size of the libraries based upon standards of the Cape Provincial Library Services).

The annual circulation of 661305 items per annum, the estimated population of 120 000 and membership of 26 044 justify a library of minimum 2000m².

Thus lack of space in the three libraries is a serious concern.

The volumes of material received from Cape Provincial Library Services increase quarterly and our existing libraries are unable to accommodate this new material due to a lack of space which on the other hand deny users access to new and updated info/material. There is also study/work space at Drakenstein and Mill Street which is a basic requirement for any library.

Furthermore no sufficient children section exists to provide an efficient and qualitative service to our future generation. Children at Drakenstein sometimes have to be sent away to return later when the library is not so busy/full (to be honest there is hardly a suitable time due to lack of space and staff).

Paarl, which can be regarded as one of the biggest towns in the Western Cape Province cannot compete with areas like Malmesbury, Kraaifontein, Worcester and others which are basically smaller in terms of population, library membership, material circulation etc. In fact we are way behind these places when it comes to library development and services due to well equipped library buildings and equipment they have.

Unless we have proper library buildings and equipment we will remain dealing with ways of combatting the lack of space instead of proactive work in ensuring we have a well informed community that can actively participate in the development of Paarl on all levels.

1.2.3 Municipal Infrastructure.

Types of services available:

a. Streets and stormwater.

99% of Streets in Paarl are built to tar standard. The only exceptions are in the Dal Josafat Industrial area, Fairyland and a few service roads. Total road length in Paarl is 337,5 km.

b. Stormwater.

Minor systems (underground pipes) are feeding major systems (open canals, trenches and major pipes) which drain to the Berg River.

c. Water.

All legal communities have access to potable water. In Fairyland and parts of Mbekweni stand pipes are serving parts of the community. Most even have separate connections.

d. Sewerage.

All legal communities have access to proper waterborne sanitation. Fairyland and parts of Mbekweni have communal facilities with waterborne sanitation.

e. Refuse removal.

2401 Bins in the central business district are emptied once a week, and refuse bags/85 litre bins in the rest of the town are collected twice a week. The entire town will be issued with 240 litre bins during 1998. Skips are emptied once a week. Streets are cleaned on an approximate 14 week cycle.

Pollution only occurs in cases of illegal dumping, which is cleared on an ongoing basis. Littering is becoming a major problem causing disruption in the normal cleansing services programmes.

A process is in progress to close down the current dumping site at Wateruintjiesvlei by June 1998. Refuse will be temporarily transported to CMC dump sites in Cape Town while still operating the Composting Works. An alternative process, vacuum pyrolysis, is being considered as an alternative to landfilling.

f. Electrical.

The following services exist:

- (i) 4 x 66kV Main Substation buildings
14 x 11kV Main Switching buildings
491 x 11kV Mini Substations, Transformers and Switchgear in Town.
- (ii) One office workstation at Parys.
- (iii) One future G.P.S. satellite facility.
- (iv) Three Generating Plants: Parys, Town Hall and Sewerage Works.

Number and Location of water sources.

The town's main water source (90% of supply) is Wemmershoek Dam, operated by Cape Metropolitan Council (CMC).

The remaining 10% is supplied from Nantes and Bethel dams, situated on Paarl Mountain, to the western parts of town. These two dams are filled either from their own catchment areas, or by pumping water from the Berg River during low rainfall periods. A number of reservoirs in the town's domestic network provides spare capacity for emergency situations (details can be given if needed).

Purification or Chlorination of water.

Wemmershoek water is being purified by the CMC. Paarl Mountain water is being chlorinated at Klipdam reservoir.

Sufficient water sources:

Paarl is 90% dependent on the CMC for water supply, especially after the proposed Witterivier Scheme has been turned down by the Department of Water Affairs and Forestry.

The cost of bulk water supply will however rise substantially in the years to come as Paarl's demand is growing rapidly, and therefore also the volume in excess of the "free water" volume from CMC.

Extensions made to Infrastructure.

Extensions are constructed to existing infrastructure continuously, e.g. at new developments and industrial areas. For all services mentioned in paragraph 1, amounts are budgeted every year for network extensions (refer to 5 year capital budget).

1.2.4 Post Office.

The Post Office renders the following:

- Services
- Postal services
- Pension payouts
- T.V. licences
- Payment of telephone and other accounts.

There are 7 post offices in Paarl and Mbekweni. Postal deliveries in Paarl are done at 3100 post box addresses, 52 private bags, 16 639 houses and there are also 2400 post boxes available at communal address boxes (Fairylane and La Perla).

Postal deliveries for Mbekweni are processed by the depot in Wellington. There are 800 post boxes available at one communal address box and 1208 houses receive hand delivery of mail.

The Post Office employs 41 people and have no need for expansion, save for further placements of address boxes at new and existing housing developments.

1.2.5 Telephone services.

Information regarding the use of cellphones in Paarl is not available as yet.

70% of all residences in Paarl and Mbekweni have a telephone and 100% of all residences have access to a telephone booth within 5km of the residence.

1.2.6 Safety and Security.

1.2.6.1 Fire Brigade.

Our range of jurisdiction comprises 67 km². The range of services we provide are fire fighting, special services (i.e. motor accidents, medical assistance, etc. and hazardous material management).

We have a fire station in Paarl and a satellite station in Mbekweni. This satellite station is where the present housing office is in Drommedaris Street. The fire department and the housing office partly share the building.

It is envisaged that the satellite station would in the future be utilised as a training centre for the fire department, once the housing section moves to their new building scheduled to be built in Mbekweni.

Our existing facilities are adequate to accommodate 12 men per shift. With the appointment of females or more staff in the future our facilities should then be improved, renovated/or devided to accommodate them (i.e. toilet, shower and sleeping facilities).

The Traffic Department would possibly in the not to distant future be moving their administration block to the testing station, pending the completion of their administration block.

If the above takes place, the present traffic administration block would be allocated to the fire department which will then allow for development.

The number of vehicles used for fire fighting purposes are as follows:

6 Fire Engines

2 Skid units

5 Bakkies

(Total 13)

One water tanker from the parks section is also used as an additional water supply in case of an emergency.

In total we have at present 56 permanent personnel in our service and 80 reservists.

1.2.6.2

Police.

The police have 3 stations, one in Paarl West, one in Paarl East and one in Mbekweni. A total of 246 people are employed by them. There is, according to them, a need to expand police services.

Specialist services that are operated in Paarl include the Detective Unit, Car Theft Unit, Dog Unit, Liquor Licences, Business Watch and so forth.

The main crimes that are encountered are ordinary theft, ordinary assaults, burglaries, and assaults with intent to do grievous bodily harm.

Crime prevention is a function of the South African Police and not of a local authority. The S.A.P. have various strategic plans and media campaigns by which they endeavour to increase awareness and prevent crime for example campaigns directed towards the elderly and children.

The intervention of a local authority in the S.A.P. strategy might not be appreciated. It would however be welcomed if the local authority is represented on a local Police Forum. An official such as the Town Clerk or his deputy or one or more Councillors can be delegated to attend forum meetings and to convey the needs of the S.A.P. insofar as it is the function of the local authority to fulfill such needs and crime prevention strategies (such as the provision of high-mast lighting) to the Council for implementation.

1.2.6.3 Prisons.

Paarl has only one prison, namely Allandale, which has accommodation for 348 prisoners. In December 1997 it contained 600 prisoners, however.

A total of 260 people are employed of which 242 work at the prison and 18 oversee the rehabilitation and community service programmes.

Rehabilitation programmes offered include:

- alcohol and drug abuse
- life skills training .
- conflict management and aggression
- sexual education
- parole

Prison labour is only utilised for Departmental needs such as cleaners, chefs, waitrons, workshops and agriculture.

1.2.6.4 Magistrate's Court.

Paarl has one Magistrate's Court where 44 people are employed.

1.2.6.5 Traffic Control.

The Traffic Section of the Municipality employs 63 people. Services offered include:

- learner's and driver's licences tests
- roadworthiness of motor vehicles tests
- registering and licencing of motor vehicles
- issuing of fines
- issuing of public driving permits
- issuing of driving instructor certificates

The Traffic Chief states that more staff are needed in this section.

1.3 Community Services.

1.3.1 Churches.

In Mbekweni, 17 churches own land for that purpose. In Paarl approximately 40 religious organisations own 81 erven zoned for that purpose. It is not known how many of the erven in Mbekweni and Paarl, belonging to these organisations, are still vacant.

A total of 90 applications have been submitted to the Department of Planning and Development for land zoned for church purposes.

In December 1996 Council approved the recommendation of the Department Planning and Development to rezone a further 10 sites in Mbekweni for church and community purposes. A similar study regarding the need for church land is needed in Paarl. Money for this purpose has been requested on the 1998/1999 budget under General Planning Services.

1.3.2 Sports and Recreation.

The following sports facilities exists:

TYPE OF FACILITY	TOTAL NUMBER OF FASILITIES	PLACE/NEIGHBOURHOOD
Tennis Courts	18 courts	2 Mbekweni, 10 Du Toit Street, 6 Ambagsvallei Street
Netball Courts	6 courts	Dal Josafat & Du Toit Street
Rugby Fields	12 fields	Faure Street, Boy Louw, , Dal Josafat, Mbekweni, New Orleans
Cricket Fields	9 fields	Parys, Dal Josafat, Mbekweni, New Orleans
Soccer Fields	10 fields	Mbekweni, Boy Louw, New Orleans
Athletic Tracks	3 tracks	Faure Street, Dal Josafat, Mbekweni
Golf Courses	1	Paarl Golf Club
Squash Courts	2 courts	Parys
Badminton Courts	3 courts	Du Toit Street
Volley Ball Courts	-	-
Hockey Fields	5 fields	Parys, New Orleans
Wrestling Clubs	1 club	Du Toit Street
Car Racing Tracks	-	-
Shooting Ranges	-	-
Dart Clubs	5 clubs	?
Gymkhana Clubs	-	-
Racing Pigeon Clubs	1 club	Boy Louw
Watersport Clubs	3 swimming clubs	Faure Street, Drakenstein Swimming Bath
Cycling	1	Faure Street
Bowls	2 courts	Faure Street
Cano Club	1 club	Parys
Karate Club	1 club	Ambagsvallei

Baseball/softball	3 fields	Dal Josafat, Boy Louw
Boxing	1 club	Ambagsvallei

The Netball Club has requested land for provincial facilities and the Boland Darts Club wants land to erect a new clubhouse.

1.3.3 Transport.

(a) Traffic Control.

The Traffic Section at the Municipality has 32 vehicles and employs 30 staff members.

Approximately 15% of the population of Paarl make use of bus services, 30% use taxis and 40% use private transport.

(b) Railway.

According to the latest count of Spoornet, 30 006 people per day utilise the railway services at 4 stations in Paarl. This figure account for passengers alighting and disembarking at stations in Paarl.

1.3.4 Tourism.

Paarl has a wide variety of Tourist attractions, ranging from Museums and art galleries to architecture and wine culture. It also includes game farms and specialist breeding projects for butterflies, snakes and so on.

The tourist bureau has identified a number of objectives in order to promote the growth of tourism in Paarl, and develop tourist attractions. They can be summarised as follows:

VISION: To make Paarl the most popular tourist destination in the Cape.

Objective: To initiate a culture and education program.

Projects:

- List of cultural organisations in Paarl
- Address list of schools in Paarl
- Establishing a culture and education database
- Defining an "Arts Route"
- Save the Graves on Paarl Mountain
- Research Training for Scholars - Potential of Paarl

Objective: To co-ordinate an external communication program focussing on the relevant

authorities.

Objective: To establish a strong financial platform from which to implement the marketing strategy.

Objective: To develop, promote and maintain a strong link with the people of Paarl Projects.

Projects: Letter to Paarl business recommending use of vision statement on letterheads
Welcome to Paarl badge and educating petrol attendants.
Paarl video
Internal expo aimed at informing people of Paarl.

Objective: To promote an action program in conjunction with Paarl Business.

Projects: Continuous integration of the promotions of local business.
Tourist map for central Paarl.
A site for hawkers to conduct business.
Upgrade of Paarl station re Blue Train stop.

Objectives: To identify a number of strategic projects, focussing on the promotion of Paarl as a tourist destination.

Short term
Projects: Town routes
Outside routes
Information brochure
Art market at language monument

Medium
term
Projects: Liaison with Paarl Vintners on Nouveau Festival
Paarl brochure
INDABA participation

Long term
Projects: A WINTER event
A SPRING event
BERGFEEES

Objective: To utilise applicable technology in support of the marketing strategy.

Projects: To ensure database compatibility
INTERNET Workshop (1 day)

Some development in Paarl where the Paarl Tourism Bureau can make a direct contribution for 1998, is the development of educational programmes on different levels, inputs towards spatial developments and eco-tourism, human resource developments in the tourism industry specific especially training in respect of best service. The development of infrastructure in Paarl such as circle routes, bus service, access roads, road signs, etc is also important for Paarl Tourism Bureau.

It is proposed that the community of Paarl is involved in the development of tourism by the creation of feasts in which everyone can take part.

The market for tourist accommodation is growing and at present more than 850 people can be accommodated at approximately 70 establishments.

1.4 Social Demography.

1.4.1 Population Profile.

The projected population figure for Paarl (1998) is 112 578 based on the 1991 census figures and is calculated according to the following growth rates:

Black	:3,0	26% of population
Coloured	:1,68	54% of population
White	:1,27	20% of population

(It is common knowledge that under-enumeration took place in 1991)

The amount of males and females are more or less equal (see Table 1 attached). The economically active sector of the population is usually regarded on age 20 to 64. In Paarl 57% of the population falls within this age category.

1.4.2 Health Care Facilities.

Paarl is served by a number of private and public hospitals and clinics. Provincial facilities include the T.C. Newman Day Hospital, Paarl Hospital and Sonstraal Hospital. Private facilities include Medi-Clinic Hospital, Drakenstein Day Hospital and Paarl-Med which is a private clinic. Municipal facilities comprise of the following clinics:

J.J. du Preez Le Roux
Klein Nederburg
Dalvale
Patriot Square
Mbekweni

Approximately 780 TB cases per annum are treated in Paarl. The number of cases per annum has increased since 1991.

There are approximately 74 general practitioners and 33 specialists in Paarl. Specialist services include dental, eye, ear-nose-throat, orthopaedic, psychiatric and other services.

1.4.3 Welfare.

A number of welfare organisations operate in the Municipal area, including

S.A. National Tuberculosis Association

TB Alliance

Cansa

Association for Physically Disabled People

The Haven Night Shelter (can accommodate ± 80 people)

People's Dispensary for Sick Animals (temporary venue)

SPCA (mobile)

ACVV (3 branches)

There are 4 old age homes in Paarl which accommodate a total of 548 residents:

Rusoord (176)

Rusthof (104)

Huis Vergenoegd (250)

De Oude Renbaan (18)

The Government operates a feeding scheme in Paarl-East and Mbekweni. Many churches offer youth programs.

1.5 Socio-Economic Profile.

1.5.1 Institutional capacity.

(a) Organisations in Paarl.

The list of organisations in Paarl can be qualified as follows:

<u>Category</u>	<u>Number of Organisations</u>
All Sectors	74
Arts and Culture	15
Education and Training	6
Business Sector	20
Sport	1
Tourism and Environment	4
Housing	5
Health Sector	5
Welfare	26

(b) Access to Infrastructure.

Fire Protection Services.

The fire station stresses an increasing need for training and additional manpower for administrative purposes.

Municipal Services

Figures are not available for the estimated number of households that can be supported by existing infrastructure. Between 90 and 95% of households are serviced with running water and flushing toilets. However, capacity problems exist in the southern and eastern parts of the sewerage network. Amounts have been budgeted for upgrading of capacity.

The number of households with acceptable services amount to approximately 18 000. Only the illegal squatter areas have no services. Communal services still exist in Fairyland and parts of Mbekweni.

Land for further occupation is being serviced and farms within Paarl have started to be developed.

(c) Access to Housing.

Until December 1995 separate waiting lists were kept for Mbekweni, Paarl-East and Paarl West. At that stage the waiting lists for Mbekweni and Paarl-East contained 5481 and 5075 names respectively. It would thus appear that the housing need in Mbekweni is equal to that in Paarl East.

At the end of 1995 a total number of 10 577 names were on the waiting lists for Mbekweni, Paarl-East and Paarl-West. Since January 1996 one combined waiting list is kept. The combined waiting list contained 1393 names on 8 October 1997. The growth rate appears to be approximately 7,5% per annum, thus the housing need is projected as follows:

December 1995	10 577
December 1996	11 370
December 1997	12 223
December 1998	13 140
December 1999	14 125
December 2000	15 185
December 2001	16 324
December 2002	17 548

The current need for housing is 11 970 (10 577 + 1393). If only 5000 additional houses are provided by year 2002 it would mean an increase in the backlog (17 548 - 5000 = 12 548).

Currently the following housing projects for government subsidised housing are in different stages of planning and construction:

Mbekweni	Project 2	835 units
	B & C Elocks	372 units
	White City	<u>291 units</u>
	Total	1498 units
Paarl-East	Amstelhof.35	237 units
	Project 1	760 units
	Fairyland	260 units
	Housing Scheme 43	<u>174 units</u>
	Total	1431 units

The abovementioned projects will provide 2929 government subsidised houses.

Two further projects will alleviate the need for middle income houses:

Erf 557, Mbekweni (to be developed by a tenderer) ± 126 units
 Erf 16161, Paarl East (to be developed by a tenderer to Provincial Administration) ± 1 000 units

Taking the middle income housing into account a total of 4055 housing units should be established during the course of the next two years. In order to meet the projected need by 2002, another 13493 houses need to be established, or 3373 housing units per annum.

More land for housing needs to be identified via a Structure Planning Process.

1.5.2 Employment and Education.

The Department of Labour indicated that, on average

in 1995	195 people
in 1996	28 people
in 1997	67 people

per month have drawn unemployment funds.

Unfortunately no statistics are available on the exact number of

unemployed people per month (including those who do not qualify for unemployment funds). Neither are there any statistics available on education levels.

The following statistics regarding the composition of the labour force indicates the level of employment:

COMPOSITION OF THE LABOUR FORCE, 1980 AND 1991

YEAR	TOTAL LABOUR FORCE	FORMALLY EMPLOYED	UNEMPLOYED	ACTIVE IN INFORMAL SECTOR
1980	44597	39281	2048	3268
1991	60376	41299	7440	11637
YEAR	TOTAL LABOUR FORCE (%)	FORMALLY EMPLOYED(%)	UNEMPLOYED (%)	ACTIVE IN INFORMAL SECTION(%)
1980	100	88.1	4.6	7.3
1991	100	68.4	12.3	19.3

From 1980 to 1991 unemployment increased by 7,7% from 4,6% to 12,3%. The unemployment figure for 1998 is unknown. From the above table it is clear that formal employment has also seriously decreased, by nearly 20%. However, the informal sector seems to have absorbed a large proportion of the impact by increasing with 12% from 7,3% to 19,3%.

Income distribution is indicated in the table below:

INCOME DISTRIBUTION OF THE POPULATION

INCOME GROUP	WHITE(%)	COLOURED (%)	BLACK(%)	ASIAN(%)	TOTAL(%)
R0-R800 per household per month	1.3	2.2	2.4	1	6.9
R800-R1500 per household per month	2.4	12.5	11.2	5.9	32
R1500-R3500 per household per month	3.1	6.1	7.8	3.2	20.2
R3500 + per household per month	48.9	20.7	19	26.4	88.9
TOTAL	55.7	41.5	40.4	36.5	

There are still disparities between the incomes of the different race groups.

1.5.3 Economic Structure.

Paarl has a balanced economic base. In that agriculture, commerce (formal and informal) and industry all contribute to the economic growth of the area. Tourism is fast becoming a major player in the economic and employment sectors.

TABLE 1

TOTALS				
Year	Total	+0-14	+15-64	65+
1980	113 200	37 127	71 728	4 405
1991	136 121	38 918	91 642	5 561
MALES				
Year	Total	+0-14	+15-64	65+
1980	60 256	18 868	39 517	1 871
1991	69 304	19 536	47 486	2 282
FEMALES				
Year	Total	+0-14	+15-64	65+
1980	53 004	18 259	32 211	2 534
1991	66 817	19 382	44 156	3 279

LOCATION		
Year	Urban	Non-urban
1980	72 594	40 666
1991	94 850	41 271

AGE												
Gender	Totaal	+0-4	+5-9	+10-14	+15-19	+20-24	+25-34	+35-44	+45-54	+55-59	+60-64	65+
Male	69 300	6 844	6 751	5 939	7 057	7 912	13 534	9 314	5 893	2 240	1 530	2 283
Female	66 821	6 877	6 728	5 779	6 959	7 396	12 161	8 473	5 620	2 005	1 547	3 279
Total	136 121	13 720	13 479	11 718	14 016	15 308	25 695	17 787	11 512	4 245	3 083	5 562

AGE												
Race	Totaal	+0-4	+5-9	+10-14	+15-19	+20-24	+25-34	+35-44	+45-54	+55-59	+60-64	65+
White	24 119	1 592	1 770	2 060	2 413	1 685	3 783	3 523	2 832	1 102	971	2 388
Coloured	89 937	9 702	9 708	7 897	9 668	10 873	17 498	11 147	6 611	2 457	1 657	2 719
Black	21 694	2 393	1 959	1 722	1 900	2 713	4 327	3 064	2 045	684	447	442
Asian	371	33	43	38	35	36	87	53	24	2	8	12
Totaal	136 121	13 720	13 480	11 717	14 016	15 307	25 695	17 787	11 512	4 245	3 083	5 561



Pearl
MUNICIPALITY
MUNISIPALITEIT
MUNISIPALA

Integrated Development Framework

Chapter 3: Vision, Mission and Objectives

July 1998

Prepared by



URBAN AND ENVIRONMENTAL
PLANNERS INC.

64 Buitenkant Street
Cape Town
Tel: 465 0590
Fax: 465 0592
E-mail: mcaplan@gem.co.za

Contents

VISION	3
MISSION	3
OBJECTIVES	3
1) HOUSING AND LAND	3
2) ECONOMIC DEVELOPMENT, EMPOWERMENT AND JOB CREATION	3
3) FINANCIAL OPERATIONS	3
4) ORGANISATIONAL STRUCTURE AND FUNCTIONING	6
5) COMMUNICATION AND COMMUNITY DEVELOPMENT	6
6) SOCIAL FACILITIES AND SERVICES	7
7) INFRASTRUCTURAL SERVICES AND FACILITIES	8
8) DEVELOPMENT PLANNING AND LAND-USE	9
9) AGRICULTURE	9
10) MANAGEMENT OF DATA	10

Vision

A united Paarl where all its people prosper through the effective utilisation of ALL its resources: economic, natural and human.

Mission

The Paarl Municipality strives to ensure the sustainable economic development and growth of Paarl to address past imbalances and improve the quality of life of all our people through sound management of our resources in partnership with the community.

Objectives

1) *Housing and Land*

2.1) 5000 quality houses erected by 2003.

- i. Establish a framework (including identification of land), with involvement of all role-players, for housing delivery by December 1998.
- ii. Establish a policy on squatting and land invasion by December 1999.
- iii. Formulate a strategy and secure funding stream (and sources) for the implementation of the framework by December 1999.
- iv. Achieve erection of houses with involvement of local community in construction by December 2003.

Principles for process

- Involve and empower local communities through the project cycle.
- Facilitate delivery through appropriate building regulations, involvement of expertise from NGOs and universities/technikons and through assisting communities in applying for subsidies.
- Train community members in skills related to construction.
- Source alternative funding from private institutions, international donors and employers.

2) *Economic development, empowerment and job creation*

Overall

- 2.1) Broaden the economic base of Paarl through optimisation of present resources, the identification of new sources of income and job creation

Job creation

2.2) Create 10 000 new jobs by 2003

- i. A strategy should be in place by December 1998 to enable the Paarl Municipality to support small and emerging businesses through skills training, contracting, and through facilitating linkages with established businesses.
- ii. Establish a database of all skilled and semi-skilled labour within Paarl and local contractors by July 1999. By July 2000, the Paarl Municipality must have a plan in place to ensure that all jobs, contracts and appointments made are to locals, unless these are not available locally.

Development

- 2.3) Need satisfying services must be rendered to the business and commercial sectors and the business and commercial sectors expanded through the identification and attraction of new investments by 2003
- Complete an audit and needs assessment of business activities in Paarl, including what opportunities existing for encouraging new business relocation and growth in Paarl, by December 1999.
 - Work with existing businesses and entrepreneurs to identify new business opportunities and development by December 2000.
- 2.4) Develop and implement a marketing strategy for Paarl by 2000.
- Investigate and catalogue the various mechanisms available for marketing Paarl (brochures, video, website, etc.) and their associated costs and benefits by December 1998.
 - Plan and develop various media strategies by July 1999 with the involvement of all the key role-players.

Principles

- Marketing strategy must be based on needs of local business and linked to developing identified economic development and job creation opportunities.

Community capacity building

- 2.5) Establish an effective community capacity building programme, with an operational resource centre, by 2003
- Undertake a needs and resource analysis by July 2000.
 - Develop a technical skills development programme through close cooperation with schools and educational centres by July 2001.
 - Identify existing programmes, funding (including international) and organisations by July 2001 that can assist with community development and capacity building programmes.
 - Through effective communication with local communities enable them to participate fully in Council matters by July 2001.
 - Have a skills development centre operational by 2003.

Tourism

- 2.6) Promote tourism in new and innovative ways so as to substantially increase new tourists and repeat tourists by 2003
- The Tourism sector must be actively developed through the development of a tourism strategy – to be finalised by July 1999. This strategy must identify opportunities for all communities in Paarl, and include costs related to training and development.
 - Opportunities and ideas identified in the Strategic Planning Workshops must be developed and incorporated into the strategy.

Principle

- Tourism development must be directly linked to job creation and empowerment.
- Tourism development must involve all the relevant role-players and be in conformance with the White Paper on Tourism.

SMMEs (Small, Micro and Medium Enterprises)

- 2.7) Promote the establishment of SMMEs in Paarl through appropriate tender Procurement, Deregulation and appointment of small contractors by December 2001
- Assess the national frameworks on the promotion of SMMEs and Tender Procurement to establish how SMMEs within Paarl can be supported by December 1999.
 - Outline a strategy, in conjunction with the relevant stakeholders, to promote SMMEs, by December 2001.

Industrial

- 2.8) Promote industrial development and investment in Paarl through targeting international investment, establishment of appropriate policies and incentives for new industrial development and a cooperative approach to working with business in identifying and putting together new ventures. Establish a framework for this by December 2002.

Privatisation/Outsourcing/Contracting Out

- 2.9) Identify and promote public/private partnerships in a manner that will ensure a win-win situation for the Council, employees and consumers.

Informal Business

- 2.10) Facilitate the development of the informal business sector through a range of initiatives (50% of which should be operational by December 2003) including:

- appropriate development and regulation.
- the establishment of a database,
- the establishment of a Local Business Service Centre,
- Beehive industries,
- encouraging partnership between formal and informal businesses where appropriate.
- the formulation of appropriate bylaws, and
- a market square where informal businesses can market and sell their products.

3) *Financial Operations*

General

- 3.1) Optimise use of Paarl's resources and obtain more funds through the implementation of sound financial principles

Legal

- 3.2) Ensure the financial management of the Municipality in accordance with the applicable legislation with immediate effect

Principles

- The guiding principles as laid down in the Strategic Workshop for Paarl (4 September 1997) must assist Council in meeting the above objective.

Income sources

- 3.3) Ensure that present sources of income are protected and expanded
- i. Review current sources of income, their levels of return, continued viability and availability by December 1999.
 - ii. Develop a strategy to develop income sources and ensure payment for services by December 2001.

Government Grants and Subsidies

- 3.4) Ensure retention of existing government grants and subsidies and take steps to identify sources of government funding for specific projects
- i. Ensure payment of current grants and subsidies as per established agreements by December 1991.
 - ii. Investigate new or other sources of government funding for specific projects/purposes by December 2000.

4) Organisational Structure and Functioning

General

- 4.1) Ensure an effective and efficient organisational structure and its functioning is established for the Paarl Municipality and running by December 2003

Structure

- 4.2) Ensure the organisational structure of Council is aligned to its priorities to ensure effective and efficient service rendering by December 2003

Functioning

- 4.3) Ensure that Councillors and officials are empowered to be effective and efficient with a proper policy framework by December 2003
- i. Ensure that Councillors are kept properly informed through a Management Information System (MIS) by December 2003.
 - ii. Establish a system to monitor implementation and development of policies in keeping with the Objectives of the IDP by December 2003.
 - iii. Identify where there is a need for better skills/knowledge amongst Councillors and establish training schemes to meet them on an ongoing basis.
 - (iv) Establish and implement an effective affirmative action policy by December 2001.
 - v. Assess use of technology and identify how new technologies, such as GIS, can be used to improve performance of Council by December 2001.
 - vi. Ensure that the community of Paarl has access to municipal facilities at appropriate times and places by December 2001.

5) Communication and Community Development

General

- 5.1) Establish proper internal and external communication and facilitate community development

Communication

Establish effective internal and external communication channels and maintain them so as to benefit all Council employees and the community

- i. Establish an internal staff newsletter by December 1998.
- ii. Ensure steps are taken to create a unified culture within the Municipality by December 1998.
- iii. Ensure steps are taken to communicate Council ideas, policies and programme to the business and local community of Paarl by December 1998.

6) Social facilities and services

General

- 6.1) Provide effective basic services and redress imbalances in service delivery by 2003
- Establish a mechanism to ensure a 97% average payment of services by January 1999.
 - Reduce arrears payments to 60% by January 1999.
 - Reduce arrears payments to 90% by January 2000.
 - Address 60% of imbalances in service provision by January 2001.
 - Reduce arrears payments to 97% by January 2002.
 - Redress all imbalances in service delivery by January 2003.

Health

- 6.2) Establish a sustainable framework for primary health care delivery by 2001
- Identify primary health care needs and associated needs for financial and human resources by December 1998.
 - Acquire adequate financial and human resources for primary health care by December 1999.
 - Establish a framework for ensuring equitable and efficient utilisation of existing resources and staff, and for managing primary health care facilities on a sustainable basis by December 2001.
- 6.3) Establish a care and counseling centre for HIV positive and STD clients by June 1999
- Establish a properly staffed and equipped counseling centre by December 1998.
 - Set up a counselor training scheme, using existing counselors, by May 1999.
 - Establish a strategy to ensure proper financial and other support for the counseling and support centre, by June 1999.
- 6.4) Establish a sustainable home care service for the frail and geriatrics by 2003
- Ensure immediate intervention to prevent current facilities from collapsing.
 - Establish a health awareness programme for the elderly by December 2000.
 - Establish a framework for effective, ongoing home care service that is financially sustainable by December 2000.
- 6.5) Upgrade existing clinics to full comprehensive care clinics with rehabilitation, curative and preventative care facilities by December 2000 *(is this LG responsibility?)*
- Equip clinics with necessary materials relating to preventative care by January 2000.
 - Equip clinics with the necessary diagnostic and other equipment for necessary primary health care services (e.g. examination couches, sphygmometers, oxygen tanks, ear, nose and throat sets) by January 2000.
 - Establish a strategy to ensure effective use of existing human resources through proper use of PHC sisters and rotation and deployment of staff to areas of need, by January 2000.

Crime prevention

6.6) Establish crime prevention and drug abuse awareness programmes established for schools and educational institutions by 2003

- i. Initiate education programmes around crime prevention at crèches by January 1999.
- ii. Establish organised recreational facilities and after school activities for school children by July 1999.
- iii. Establish a crime prevention and drug awareness programme, in conjunction with schools, communities and government by January 2000.
- iv. Assess mechanisms that the Paarl Municipality can implement to prevent crime and the costs associated with these by January 2001.

Security/emergency services

6.7) Establish a centre where all crises and emergencies can be managed and coordinated, with satellites around Paarl, by September 1997

- i. Establish a committee, representative of all emergency services, to oversee implementation of the concept by July 1997.
- ii. Allocate sufficient financial resources to ensure that the centre is properly staffed and has the necessary facilities by July 1997.

6.8) Establish awareness and training workshops within communities on emergency and crises procedures from August 1997.

- i. These workshops should be held in all areas of Paarl and to be facilitated by the Committee.

Educational and Training

6.9) Promote education and training of the community through the utilisation of existing facilities and resources, with a specific focus on the development of technical training. Establish a framework for this by December 2003

- ii. Encourage the development of technical subjects at schools.
- iii. Encourage greater after-hours utilisation of school facilities.
- iv. Promote awareness about the environment at schools.

7) *Infrastructural services and facilities*General

7.1) Ensure infrastructural development of Paarl through direct Council involvement or, where necessary, facilitation thereof

7.2) Ensure basic infrastructure services are provided to all households and community facilities in Paarl by 2003

- i. All new developments to have tarred roads within six months of being built.
- ii. 95% of all households should have electricity by 2000.
- iii. 95% of all homes should have clean drinking water by 2000.
- iv. All existing roads must be surfaced and properly maintained by 2002.
- v. All district collectors and above class roads should have streetlights by 2002.
- vi. All public open spaces should have lights by 2003.
- vii. There must be a municipal office in Mbekweni by the end of 1998.
- viii. An additional library should be located in Paarl East by 2000.
- ix. A multi-purpose centre should be established in Paarl-East and Mbekweni by 2003.

8) *Development planning and land-use*

General

- 8.1) Ensure the development of an integrated short, medium- and long term planning process based on effective data and needs management

Legal

- 8.2) Ensure that Council remains up-to-date with the latest developments, requirements and legal obligations in terms on integrated planning and development

LDOs/IDP/LED

- 8.3) Compile an Integrated Development Plan, in conformance with the Principles of the Development Facilitation Act and according to the needs identified and prioritised by the community in support of Local Economic Development by December 1999

Development Strategy

- 8.4) Produce a Development Strategy as a component of the Integrated Development Plan by July 1999
- i. Formulate a Development Strategy for Paarl by December 1999.
 - ii. Produce a plan to integrate the Strategy by July 2000.
 - iii. Produce a Spatial Development Framework for Paarl by July 2000.

Principles for land-use planning

- There must be public involvement in defining land-use issues (e.g. restitution).
- Land-use planning and plans must be monitored and evaluated against the goals of the IDP.
- The Land-use plan must thus support the goals of the IDP.

9) *Agriculture*

- 9.1) Ensure the beneficiation of existing agricultural industries, specifically the wine industry by 2003

- i. Look at mechanisms to establish symbiotic relationships between industries by December 1999.
- ii. Working in cooperation with the agricultural sector, assess and identify new investment possibilities linked to beneficiation by December 2000.

- 9.2) Establish communal horticultural farms for various communities by the end of 1997.

Work with the RDP Forum, elected representatives and local farmers to:

- identify small farmers,
- land,
- formulate a strategy, and
- establish the capacity to administrate and implement the development of horticultural farms.

- 9.3) Make 100 hectares of suitable grazing land available for livestock farming by the end of 1998

Work with the RDP Forum, elected representatives and local farmers to:

- identify small farmers,
- land,
- formulate a strategy, and
- establish the capacity to administrate and implement the development of livestock farming.

10) Management of Data

10.1) Make optimal use of the Geographic Information System

- i. Ensure the GIS is fully operative and used to serve a multi-purpose function in terms of planning and data management by December 2003.

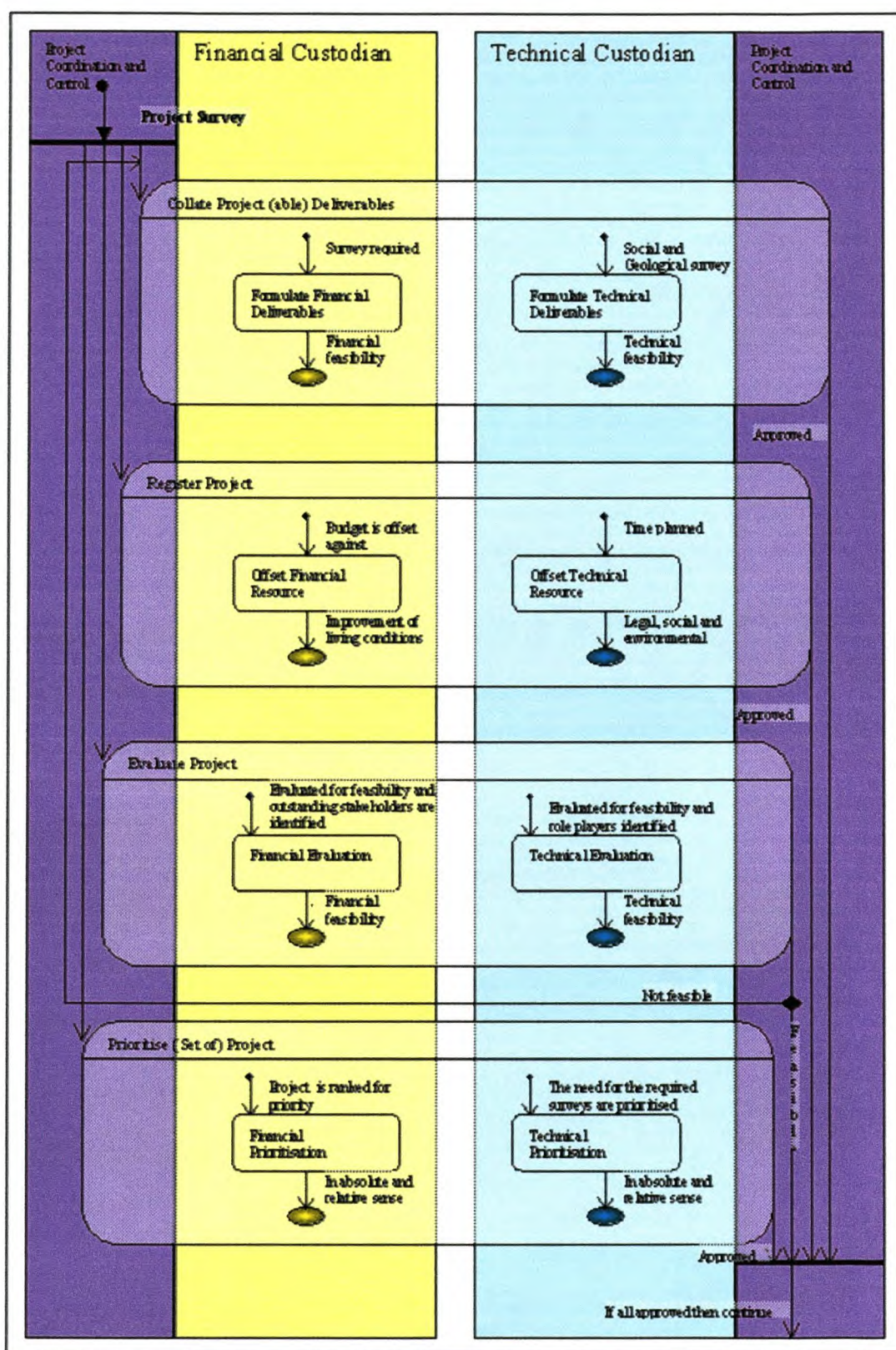
10.2) Establish a marketing database for the town by integrating all the available and relevant data and use this to compile a marketing profile by December 2000

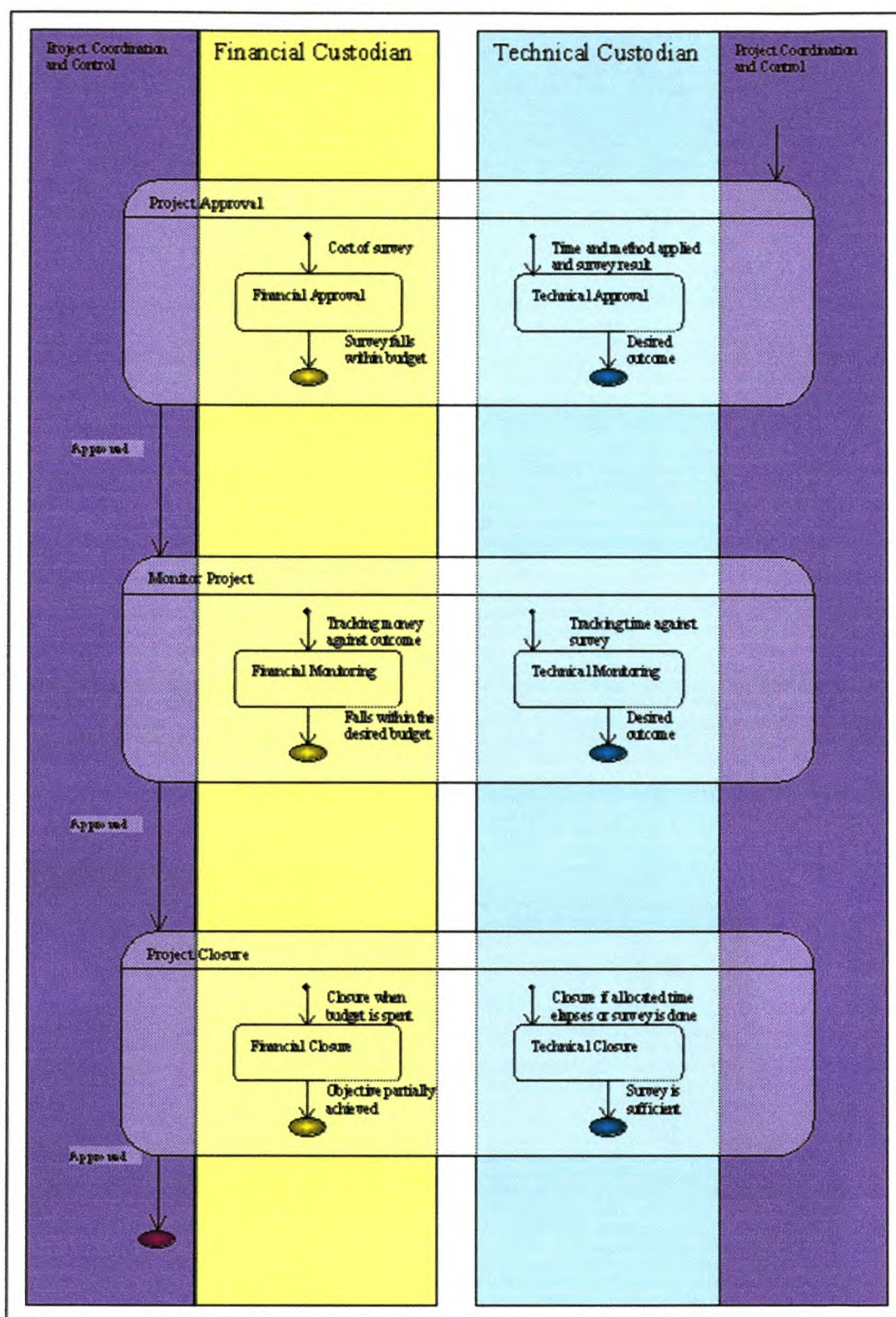
Appendix E: UML Activity Diagrams

E.1 Example Scenario Part Two

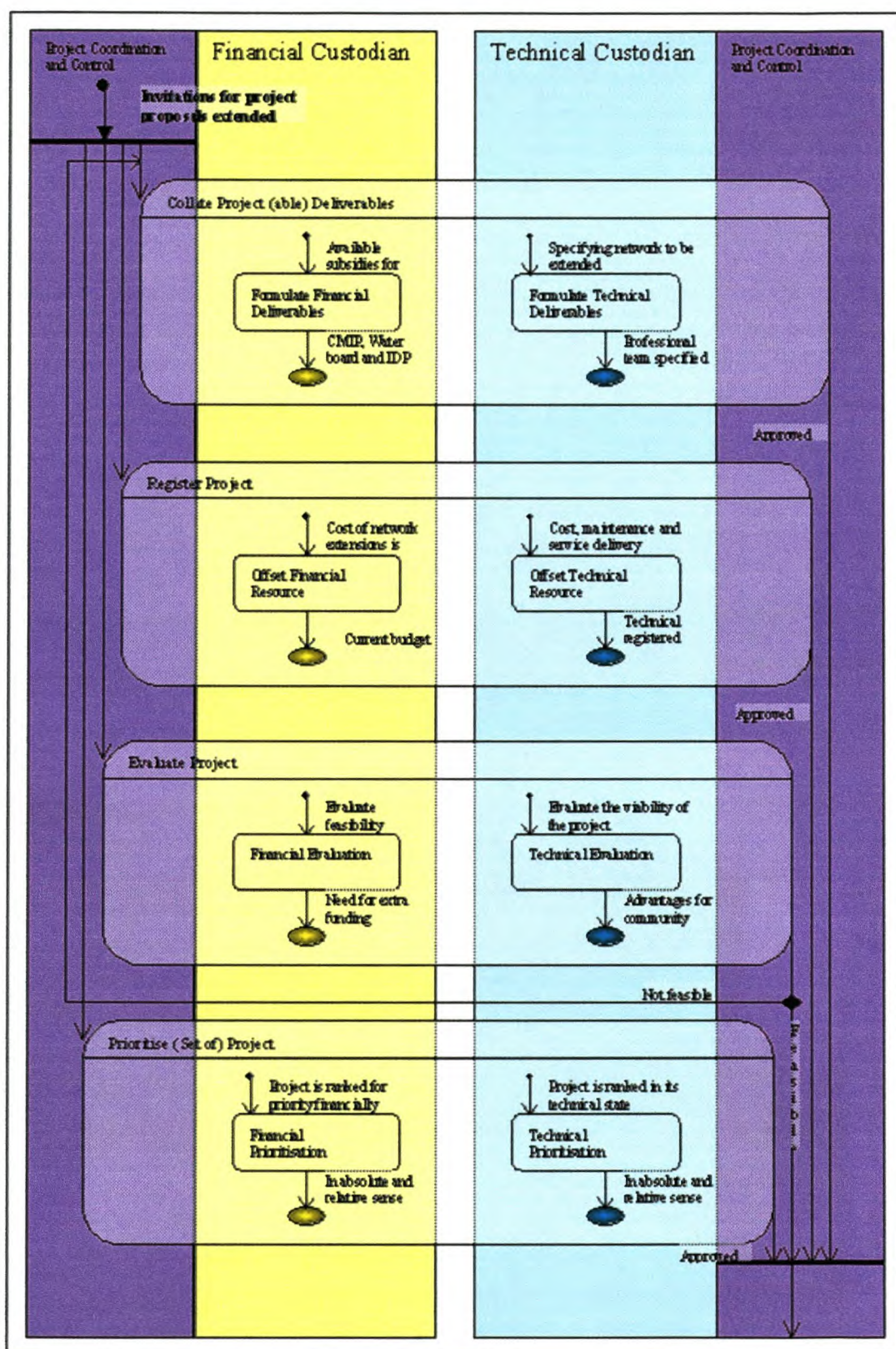
E.2 Example Scenario Part Three

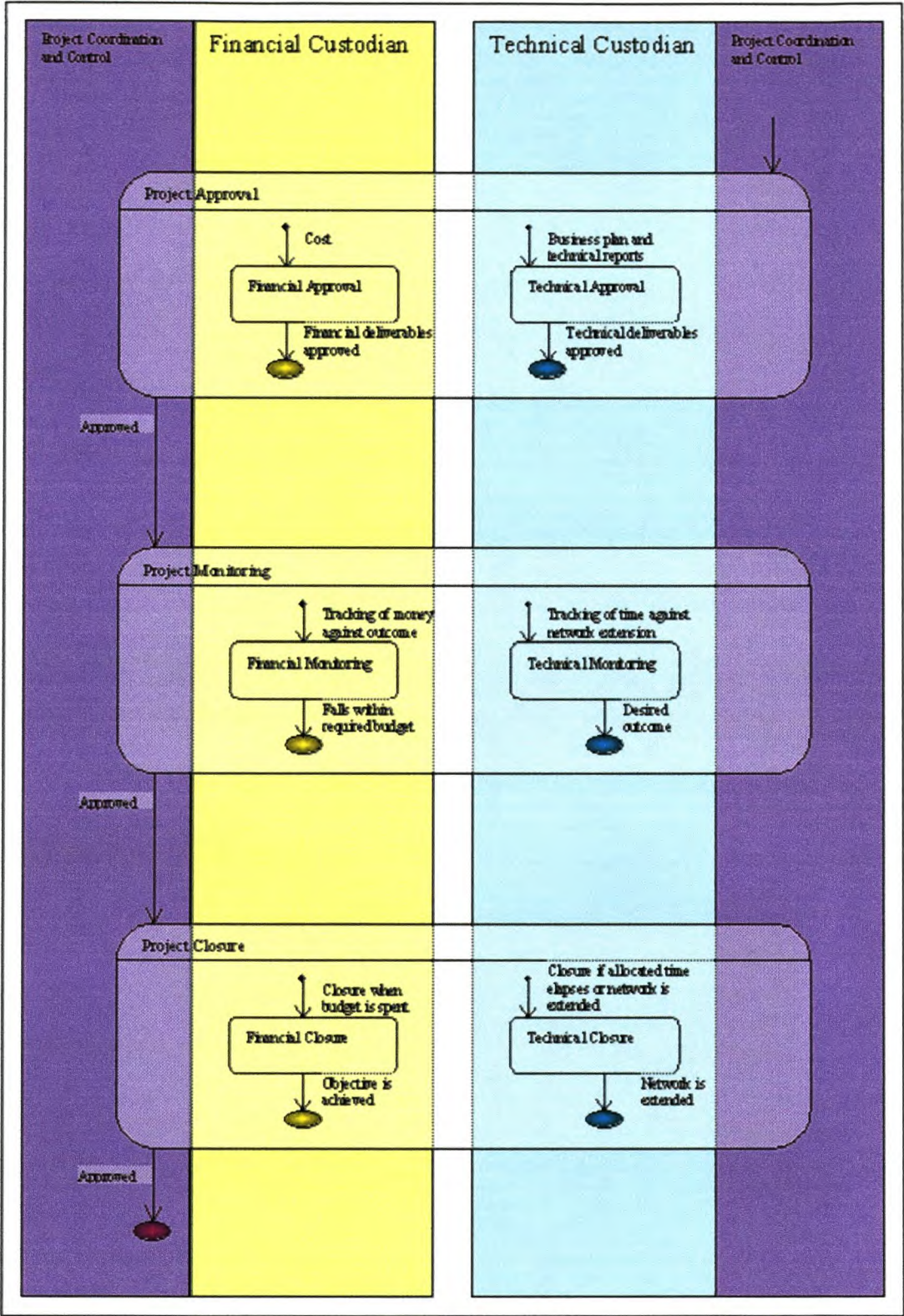
Scenario Part Two





Scenario Part Three



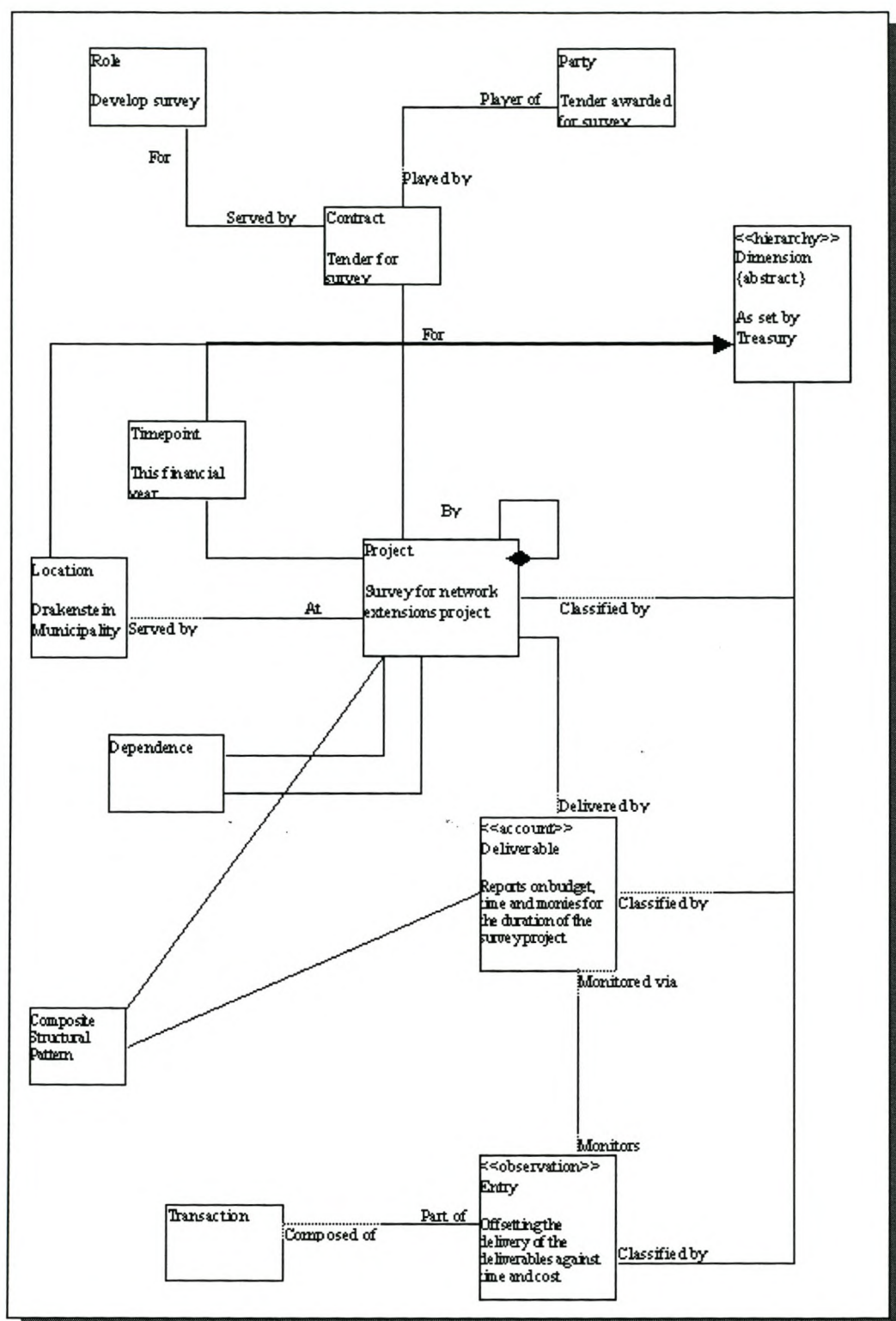


Appendix F: UML Class Diagrams

F.1 Example Scenario Part Two

F.2 Example Scenario Part Three

Scenario Part Two



Scenario Part Three

